



Energy Sustainability: Bridging the Gap between Oil and Gas Operations and Community Well-Being in the Niger Delta Region, Nigeria

CHIJOKE-CHURUBA, J

Antan Producing Limited, Sinoki House (2nd floor) Plot 770, Samuel Ademulegun Avenue, Cadastral Zone Central Business District Abuja, Nigeria

Corresponding Author: juliet.ngozi@gmail.com

:

ABSTRACT: Sustainability is an important issue in energy provision for meeting increasing needs. However, harvesting energy resources in communities while protecting the ecosystem and reducing issues of environmental degradation to the barest minimum are the ideal target for stakeholders, but usually not always attainable. The objective of this paper is therefore to review the sustainable energy arrangements with ambitions to significantly bridge the gaps between oil and gas operations of firms and improved community well-being in the Niger Delta Region, Nigeria using secondary information and data harvested from previously published studies found Online. Specifically, the paper will examine some effects of oil and gas exploration in communities, examines metrics that can be used to track community well-being, the possible conflicts of interest that could occur between firms and host communities in oil and gas operations as well as measures in the past to ameliorate these challenges and improve the community well-being in issues pertaining to oil and gas operations of firms. The study recommends that continuous stakeholder engagement be carried out in order to make for smooth oil and gas operations. Furthermore, it makes for proffers workable solutions to the challenges that accentuate possible conflicts. The study also identifies different key stakeholders in this gap-bridging process and their various roles.

DOI: <https://dx.doi.org/10.4314/jasem.v27i11.20>

Open Access Policy: All articles published by **JASEM** are open-access articles under **PKP** powered by **AJOL**. The articles are made immediately available worldwide after publication. No special permission is required to reuse all or part of the article published by **JASEM**, including plates, figures and tables.

Copyright Policy: © 2023 by the Authors. This article is an open-access article distributed under the terms and conditions of the **Creative Commons Attribution 4.0 International (CC-BY- 4.0)** license. Any part of the article may be reused without permission provided that the original article is cited.

Cite this paper as: Chijioke-Churuba, J. (2023). Energy Sustainability: Bridging the Gap between Oil and Gas Operations and Community Well-Being in the Niger Delta Region, Nigeria. *J. Appl. Sci. Environ. Manage.* 27 (11) 2503-2507

Dates: Received: 30 September 2023; Revised: 29 October 2023; Accepted: 07 November 2023 Published: 30 November 2023

Keywords: Energy sustainability; oil and gas operations; community wellbeing; environmental degradation

Sustainability entails the avoidance of the depletion of resources in order to maintain balance and enable these resources to be available over a long-term. Sustainability also entails the efficient and optimal use of resources by avoiding waste so that a high output level is achieved. Achieving sustainability entails implementing practices that involve efficient resource use without sacrificing what is available for future generations (Bemberger *et al.*, 2012). Sustainability is most vital when it comes to utilization of natural resources. This is because it is of utmost importance that resources are not just efficiently utilized, but used in a manner that will make them available for future generations. Oil and gas are a type of natural resource that is non-renewable and thus its optimal management requires promulgating strategies about sustainability. The oil and gas industry plays a prominent role in global energy production and economic development, especially in resource dependent economies. It is the

economic mainstay of many countries, providing employment and foreign exchange earnings as well as foreign direct investment (Davis and Scolow, 2014). Furthermore, it meets the energy needs of developing countries as it factories, offices, cars, etc. Thus its demand, though forecasted to reduce in the future due to the shifting of attention to renewable energy sources, is still not yet diminished. However, over time, the exploration of oil and gas has raised concerns pertaining to its sustainability and the environmental cost of its exploration. This study therefore aims to explore these issues by examining the challenges experienced in exploration of oil and gas, some possible measures that could ameliorate these challenges, the stakeholders in this process and the role of these stakeholders.

Challenges in Oil and Gas Exploration: One of the biggest challenges experienced in the process of oil

Corresponding Author: juliet.ngozi@gmail.com

and gas exploration is environmental degradation. According to International Energy Agency (2021), environmental degradation entails the deterioration or destruction of the natural environment due to human activities or natural processes. It also involves the decline, whether gradual or rapid, in the quality of air, water, soil and the overall health of ecosystems, resulting in negative impacts on both the environment and the well-being of living organisms, including human beings.

Environmental degradation poses significant challenges to the sustainability of ecosystems, human societies and the planet earth as a whole. These challenges take different forms which include, but not limited to; deforestation, pollution, land degradation, loss of biodiversity, climate change, ozone depletion, erosion and ocean acidification (Eweje and Perry 2011). Deforestation entails the removal of forests for agriculture or urbanization which can result in habitat loss and disrupted ecosystems. Pollution entails the release of harmful substances into the air, water or soil which can cause significant harm to human health and the environment. These include air pollutants such as emissions from vehicles and industrial processes such as mining and oil exploration, water pollution from runoff and sewage and soil pollution from contamination with heavy metals and pesticides. Land degradation involves the deterioration of the quality and fertility of soil which is often caused by inappropriate agricultural practices, mining activities, deforestation, urbanization and erosion. Loss of biodiversity involves the decline in the variety and abundance of plant and animal species in a given ecosystem. This is often driven by overexploitation of natural resources and the destruction of natural habitat. Climate change is the alteration of global and regional climate patterns due to the release of greenhouse gases, mainly carbon dioxide, into the atmosphere, which could lead to rising temperatures, extreme weather conditions and rise in sea level. Ozone depletion is the reduction of the ozone layer in the Earth's stratosphere primarily caused by the release of ozone-depleting substances which can result in increased ultraviolet radiation reaching the surface of the Earth. Erosion on the other hand is the natural or human-induced wearing off of land which is usually accelerated by activities such as deforestation, agriculture and construction which leads to the loss of fertile soil and degradation of landscapes.

The second challenge experienced in oil and gas exploration is the relationship between exploring firms and host communities. This usually results in the continuous conflicts between the firm and the members of community, which usually leads to security challenges, destruction of properties and an increase in operating costs of the firm. The relationship between oil producing firms and host communities can be complex and varies widely depending on factors

such as location, the specific firm involved, historical context as well as existing government regulations. However, this relationship has usually been marked by tension and conflict. There are significant key aspects in the relationship between oil producing firms and host communities, and these include, but not limited to; economic impact, environmental concerns, social and cultural impacts, community development, conflicts and protests, regulatory framework as well as transparency and accountability. Pertaining economic impacts, oil companies bring significant economic benefits to host communities such as job opportunities, infrastructure development and revenue for local governments through taxes and royalties (Ite *et al.*, 2008). However, there could also be negative economic consequences such as environmental damage that could affect agricultural activities, displacement of local industries and fluctuations in oil prices that could impact the local economy. These adverse economic impacts also lead to environmental concerns about activities of oil producing firms. Oil drilling and production can have significant adverse impact which include, but not limited to pollution of water sources, air pollution and deforestation. It is the host communities who often bear the brunt of these adverse effects. In addition, oil spillages have been a major issue of contention between oil companies and host communities as these can lead to long-term ecological damage and significant health risk for residents.

In addition to environmental concerns, social and cultural impacts are also a significant impact that affects the relationship between oil producing firms and communities. Oil drilling and production can have significant environmental impacts, which include, but not limited to displacement of indigenous or local populations, changes in traditional livelihoods and cultural erosion. Also, rapid urbanization and an influx of outside workers can also strain local resources and infrastructure, leading to social tensions. Social and cultural impacts usually affect community development issues. This has led many oil companies to establish corporate social responsibility (CSR) programs to support their host communities (Jenkins *et al.*, 2014). Such programs include funding for education, healthcare, infrastructure and other social projects. The effectiveness of these CSR projects vary across companies' communities depending on factors peculiar to the community and the firm. Despite the engaging in CSR activities, there are still conflicts and protests affecting the relationships between oil producing companies and host communities. Historically, these protests have led to protests, strikes and sometimes violence. These conflicts result from disputes over land rights, compensation and environmental damage. It is usually advisable that governments set regulatory framework that make oil producing companies to give back to the community in a manner that will be impactful to the residents and

the indigenes. Regulatory framework is vital because the relationship between oil companies and host communities are often influenced by the regulatory framework that are put in place (Oyewunmi and Hon, 2019). Laws and regulations governing resource extraction, environmental protection and revenue sharing can significantly impact on the dynamics of the relationship. There is a need for transparency and accountability in order to effectively achieve this. Transparency in financial transactions and revenue sharing is important for building trust between oil companies, governments and host communities. It is vital to ensure that communities receive their fair share of oil revenues and some governments aim to achieve to this transparency and accountability by measures such as the Extractive Industries Transparency Initiative (ETI) in order to address this issue (United States Department of Energy, 2020).

Sustainable and equitable relationship between oil and companies require ongoing collaboration, responsible practices and adherence to relevant regulations and international standards. This requires a multifaceted approach towards ameliorating these challenges as well as ensuring that whatever solutions that are promulgated and implemented are not only effective but sustainable over a long term. Effectively meeting this challenges is an ongoing concern for oil producing companies as it will help in reducing the devastating effects of these problems.

Solutions to Challenges in Oil and Gas Production: Meeting the challenges associated with oil and gas production requires a multi-faceted approach. This is because the environmental and social impact of oil and gas operations have raised significant concerns worldwide. In order to make for effective sustainability in oil and gas operations of organizations, it is important to take holistic steps in tackling the challenges and bridge the gap in relationship between oil producing companies and host communities. Firstly, it is important to mitigate the adverse environmental impact of oil exploration. The oil and gas industry is known for its negative environmental footprint, including greenhouse gas emissions, habitat destruction and water pollution. Mitigating these impacts are vital in order to make for sustainability. Measures that can be adopted to achieve this include, but are not limited to periodic clean-up of mining and exploration areas to limit ecological damage, the use of safer practices in exploration and mining operations, sponsorship of environmental conservation activities as well as the effective management of hazardous wastes.

It is also suggested that that oil producing companies adopt community engagement and consultation. In order to bridge the gap between the industry and communities, meaningful engagement and consultation are essential. This helps the companies to

know the issues affecting the counties as well as knowledge of their expectations of the members of the community (World Bank, 2020). This is vital as it makes for the use of dialogue to solve problems imperative which helps in creating “win-win situations” for all parties involved. Achieving this will require taking certain steps. Firstly, there should be early and continuous engagement of community members by oil producing firms in project planning phase and also the maintenance of continuous communication throughout the project’s lifecycle. Secondly, oil companies should establish a dedicated community relations team within the company that is responsible for community relations. This team should also have representatives with local knowledge and cultural sensitivity. Oil companies should also conduct thorough needs assessment in host communities in order to have a proper understanding of their priorities, concerns and aspirations. Such information should guide their CSR activities (Holland *et al.*, 2016). There should also be transparency in sharing information with the community about the impact of projects, benefits and risks involves. Regular updates should also be provided to promptly address concerns. Oil producing companies should also establish consultation mechanisms such as community meetings, town halls and focus group discussions with the aim of gathering feedback and input from community members. There should also be mechanisms for sharing the benefits of oil operations with host communities, such as employment opportunities, infrastructure development and revenue sharing agreements. In addition, it is also advisable to prioritize hiring local residents and providing training programs in order to enhance their skill-set and increase their chances of participating in the oil an as industry. Environmental responsibility should also be implemented by providing stringent environment protection measures and engage in open dialogue with the community about these measures. Also, conflict resolution mechanism should be established to address disputes and grievances in a fair and transparent manner Using mediation, collective bargaining arrangements and alternative dispute resolution processes can be useful. Oil companies should also show cultural sensitivity by respecting and preserving the cultural heritage of the host community. This can be achieved by engaging with local leaders and traditional authorities in a culturally sensitive manner (Okeke, 2021). Also, oil companies should demonstrate a long-term commitment to the wellbeing of the host community, even after projects have been completed. Thus sustainable development efforts should continue as they significantly impact communities and create long-term partnerships between companies and host companies.

In addition to demonstrating long-term commitment, it is also important that monitoring and evaluation systems should also be put in place in order to assess

the effectiveness of community engagement initiatives. This is vital order to continually ensure that initiatives meet up with given targets and also adjust strategies or modes of implementation when needed based on feedback and outcomes. In addition, it is also important for oil companies to collaborate with government agencies and regulatory bodies to ensure that the community engagement efforts adopted are in alignment with local laws and regulations. Also, it is advisable to investment community capacity building by empowering members of the local community to participate in decision making processes and also managing their own development project. Social investment and local development are also an essential element in the issue of sustainability in oil and gas operations. Firms involved in oil and gas operations can contribute to community well-being through social contracts and support for local development initiatives that significantly impact on the local populace. Oil and gas operations usually occur in regions with vulnerable communities and these operations could have positive and negative impacts. Social investments can help to mitigate negative impact while creating shared value. Achieving this entails engaging with local communities to understand their needs and concerns. Also, oil companies should develop a clear and comprehensive social investment strategy that aligns with the company's sustainable goals and the community's needs. Such strategy should be developed in consultation with community leaders, non-governments organizations (NGOs) and other stakeholders. Oil companies should also invest in education and skill development in the community as well as in healthcare and services and sanitation facilities. Activities such as building new hospitals and upgrading the existing ones can significantly improve community well-being (International Labour Organization, 2022). Implementing optimal social investment and local development also entails investing in infrastructure projects that benefit the community, such as road construction, water supply and electrification. These improvements usually enhance the quality of life of residents. Such actions will significantly improve community relations between the oil producing firm and the host community and also help promote the brand of the organization as a responsible one. In addition, local economic diversification activities can be undertaken by the oil company by investing in small and medium scale enterprises (SMEs) within the community and also where possible, helping members of the community to start businesses. This helps in reducing dependency on the oil and gas sector and further improves the economic well-being as well as purchasing power parity (PPP) of the members of the community. Implementing these measures helps oil and gas companies to effectively harness social investment as a tool for energizing sustainability and fostering community wellbeing as well as contributing

to the long-term success and reputation of the company.

Technology and innovation are also an important issue in energizing sustainability. Advancement in technology can significantly reduce adverse environmental effects of oil and gas explorations. Furthermore, innovative technology can impact on the local populace when it is made available for their use. Such technology can lead to better education facilities as well as better medical facilities. Also, carbon emissions can be reduced by investing in advanced technologies such as carbon capture and storage (CCS) in order to capture and store carbon dioxide emissions from oil and gas operations, reducing environmental impact (Chachangi *et al.*, 2023). In addition, oil companies can utilize technology for diversifying energy portfolios by investing in renewable energy sources such as solar, wind and hydroelectric power. This significantly reduces carbon footprint of oil companies while also contributing to sustainable energy. Also, implementing advanced monitoring and control systems to optimize energy efficiency in operations, reducing waste and lowering greenhouse gas emissions can be achieved by optimal use of technology. Exploring green hydrogen production by using renewable energy sources to produce clean energy sources and electrolysis to produce clean energy carrier that can be used in various applications, including transportation and industry. This can be implemented by utilizing remote sensing technologies and sensors to monitor environmental impacts and report data transparently to regulatory agencies and communities. In addition, it is also beneficial to implement digital twin technology for creating virtual models of oil and gas operations. These can be used for predictive maintenance, optimizing operations and minimizing environmental risks. Oil producing companies should also utilize technology like drone technology as well as robotics for safer and more efficient inspection and maintenance of facilities, reducing accidents and protecting communities.

Oil producing companies that utilize technology and innovation do not only reduce their environmental impact but also enhance their reputation, reduce operational risk and contribute positively to their host communities. This transformation requires long-term commitment and collaboration with various stakeholders (Patridge *et al.*, 2023). Adopting these strategies will help in building stronger and more sustainable relationships, mitigating potential conflicts and contributing positively to the social and economic development of the area in which they operate.

Conclusion: Bridging the gap in oil and gas operations and community well-being is a complex challenge that can only be tackled by a multi-faceted approach. It is vital that government plays a significant role in making legislations that encourage these aforementioned solutions as well as effective stakeholder engagement

on the part of oil companies are very important elements in achieving a sustainable balance between industry interests and well-being of affected communities as well as their relationship with host communities.

REFERENCES

- Bemberger, A; Menz, F; Buergin, R (2012). From Vision to Action: Bridging the Gap between the Oil Industry and Bio-Diversity Conservation. *Environ. Manage.* 49(1), 178-195.
- Chanchangi, Y; Adu, F; Ghosh, A (2023). Nigeria Energy Review: Focusing on Solar Energy Potential and Penetration. *Environ. Develop. Sustainability.* 25: 5755 – 5796.
- Davis, S; Socolow, R (2014). Commitment Accounting of CO₂ Emissions. *Environ. Res. Let.* 9(8), 84-108.
- Eweje G; Pery, M (2011). Sustainable Development and Stakeholder Management. Developing Sustainable Strategies for Small Business. *Bus. Strateg. Environ.* 20(3), 141-156.
- Holland, R; Scott, K; Honton, E; Austen, M (2016). Bridging the Gap between Energy and the Environment. *Energy Policy* 92, 181-189
- International Energy Agency (2021). Net Zero by 2050: A Roadmap for the Global Energy Sector.
- International Labour Organization (2022). *The Future of Work in the Oil and Gas Industry*. Geneva. ILO
- Ite, U; Ibok, U; Nwilo, P (2008). Environmental Effects of Gas Flaring in Nigeria. *J. Environ. Protect.* 6(16), 657-663.
- Jenkins, G; Macauley, D; Heffner, L (2014). Global Analysis of Anthropogenic Debris Ingestion by Sea Turtles. *Conserve. Biol.* 28(1), 129-139.
- Okeke, A (2021). Towards Sustainability in the Global Oil and Gas Industry: Identifying where the Emphasis Lies. *Environ. Sustainability. Indicator.* 12, 69-82.
- Oyewunmi, A; Hon, K (2019). Renewable Energy in the Oil and Gas Industry: A Review. *Sustainable Energy Rev.* 107, 133-146.
- United Nations Development Programme (2019). A Guide to Engaging the Oil and Gas Sector: Advice for Indigenous Peoples, Civil Society Organizations and Communities.
- United States Department of Energy (2020). Advanced Technology for Enhanced Oil and Gas Recovery. A Research Roadmap.
- World Bank (2020). The Role of the Oil and Gas Sector in Local Development.