FLARING AND VENTING OF ASSOCIATED GAS IN UPSTREAM PETROLEUM OPERATIONS IN KENYA: A NEED FOR A ZERO-TOLERANCE POLICY TO ENSURE SUSTAINABLE DEVELOPMENT OF THE ENVIRONMENT

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By

OCHIENG' OLIVER MARK KINESI

(092915)

Prepared under the supervision of

PURITY WANGIGI

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ABSTRACT

This study will examine the use of legislation to stop gas flaring and venting of associated gas in upstream petroleum operations in Kenya, and proposes an alternative solution to the ongoing gas flaring in region. In exploring an alternative solution, this study details Kenya's gas-flaring legislation; the Petroleum Act and the Model Product Sharing Contract, and the extent of their implementation, while analysing the impact they have on the environment and details how litigation can be used as a tool to combat gas flaring, juxtaposing the concept of the rule of law. This study concludes by suggesting that more stringent solutions should be explored in combating the gas flaring problem Kenya.

LIST OF ABBREVIATIONS

CBD- Convention on Biological Diversity

CH4- Methane

C02- Carbon dioxide

EIA- Environmental Impact Assessment

EMCA- Environmental Management and Coordination Act

GHG-Greenhouse Gases

IOC- International Oil Company

IUCN- The World Conservation Union

Model PSC- Model Product Sharing Contract

NEMA- National Environmental Management Authority

NCS- Norwegian Continental Shelf

OHSA- Occupational Health and Safety Act

PWC- Price Waterhouse Coopers

PA Act- Petroleum Activities Act

UNEP- United Nations Environmental Programme

UNFCCC- United Nations Framework Convention on Climate Change

WECD- World Commission on Environment and Development

CHAPTER ONE: INTRODUCTION

Backg round

Flaring and venting of gas from oil producing fields is a practice that is most often linked with the simultaneous production of oil and natural gas where there is no ready market for the gas.[1]More specifically, flaring is the process of burning natural gas in an open flame whereas venting is the direct release of natural gas into the atmosphere.

The process of flaring or venting of associated natural gas is commonly used in the petroleum industry either to release gas during an emergency situation where piping becomes over pressured or, as an outlet for gas during maintenance and equipment repairs.[2]Gas flaring for these reasons has been allowed, as the flare is operated temporarily until the emergency situation is resolved, or until maintenance activities have been completed.[3]However, the process has still been frowned upon in most developed countries, as the awareness of its harmful effects towards the environment and its wasteful nature, as much of that gas could be used to provide fuel, either for the local market or for export.[4]

Government regulations and enforcement are the most essential means for protection of the environment in the oil and gas industry, not least because of the difficulty of monitoring and enforcing voluntary codes.[5] Regulatory structures vary widely. In some countries, sophisticated mechanisms exist, with single source agencies which act as an effective focal point for environmental governance.[6] In some others however, infrastructure for effective environmental protection is virtually non-existent and considerable institutional capacity building is still necessary.

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[1] Ministry of Energy and Petroleum, *National Energy and Petroleum Policy*, 2016,27.

[2] Olawuyi D, *The Principles of Nigerian Environmental Law*, 2nd ed, Afe Babalola University Press, Nigeria, 2015,186. See also Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta' 1 (4) *American Journal of Environmental Protection*, 2013, 70.

[3] Associated natural gas, which is a by-product of petroleum production, is burned on reaching the surface with a process called flaring or by being released into the atmosphere without burning through venting.

[4] Global flaring and venting of petroleum associated gas is seen to be a significant source of greenhouse gas emissions and airborne contaminants that have proven difficult to mitigate over the years. In the petroleum industry, poor efficiency in the flare systems often result in incomplete combustion which produces a variety of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and inorganic contaminants.

[5] E&P Forum, UNEP, *Environmental management in oil and gas exploration and production: An overview of issues and management approaches*,1997,23.

[6] E&P Forum, UNEP, *Environmental management in oil and gas exploration and production: An overview of issues and management approaches*,1997,24.

Norway, for example, has put in place a carbon tax, which penalizes companies for flaring or venting gas, giving no regard to the reason given for carrying out the process.[7] In spite of this, the process is still frequently carried out in developing countries, as loopholes within various regulations provide for the frequent carrying out of the activity.[8]Moreover, in these countries, a great deal of gas flaring in many oil and gas production sites have little or nothing to do with protection against emergency situations or over-pressuring industrial plant equipment.[9] In Africa and Middle East, gas flaring is done in higher volumes mostly because the oil is of greater value, and flaring is an inexpensive way of dealing with waste. These countries lack gas processing and transportation pipelines and infrastructure, making flaring and venting the major means of getting rid of the gases, as waste material.[10]

Summarily, in as much as these countries indicate that that regulatory enforcement mechanisms and risk management procedures for oil and gas activities are incorporated into their regulatory frameworks, actual enforcement of approval conditions and regulatory limits is not occurring in a systematic and effective manner.[11] This is attributed to either lack of technical, human and financial capacity or general lack of political goodwill to environmental management efforts.

Kenya, being a relatively new player in the oil production industry, has been involved in numerous international engagements, agreements and initiatives for mitigation of gas flaring, through NEMA (National Environmental Management Authority) and its EMCA (Environmental Management Coordination Act), The Constitution of Kenya 2010 and The Petroleum Act,2019.[12] Some of these international initiatives for gas flaring and climate mitigation include the Paris Agreement, the Kyoto Protocol, the Montreal Protocol, the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC) and the Rio Declaration on Environment and Development.

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[7] Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta', 70.

[8] Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta', 70.

[9] Olawuyi D, *The Principles of Environmental Law*, 187.

[10] Anis M and Siddiqui T, 'Issues Impacting Sustainability in the Oil and Gas Industry',5(4) *Journal of Management and Sustainability*, 2015. See also Iguh N, 'Gas Flaring in Nigeria: An Abridgement of Human/Fundamental Rights', *Pinnacle Journal Publication*, 2016, 2.

[11] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 190.

[12] Ngare I and Karanja J, 'Understanding Kenya's Multilateral Environmental Agreements the Future of Environmental Governance', 10(11) *IOSR Journal of Environmental Science, Toxicology and Food Technology*, 2016, p. 37-39.

The Constitution provides that there shall be sustainable exploitation, utilisation, management and conservation of the environment and natural resources,[13] and that processes and activities that are likely to endanger the environment should be eliminated.[14] These provisions are founded on the principle of sustainable development, in relation to the environment, set out by the Rio Declaration.[15] This is also mirrored in Section 5 of the Environmental Management Coordination Act which provides for the principles of sustainable development in relation to the environment.[16] Moreover, both EMCA and the Constitution provide for the entitlements to all persons of a clean and healthy environment.[17]The Government, through the Climate Change Act, also seeks to enhance climate change resilience and low carbon emissions in order to promote sustainable development of the environment in the country.[18] It is thus assumed that in its oil drilling and exploration efforts, Kenya and all contractors involved, should still adhere to the aforementioned provisions and principles.

Contrary to this, however, the Petroleum Act permits gas flaring so long as it is under the authorization of the Ministry of Petroleum and Mining, in consultation with the National Environmental Management Authority,[19] and is in accordance with existing laws and best petroleum industry practices.[20]Although the Act provides for regulations to limit flaring and venting of natural gas,[21] such provisions are frequently taken as means by which oil companies take advantage of existing legislations to pursue gas flaring.[22] These provisions appear like special concessions to the multinational corporations that have been reluctant and indeed unwilling to stop gas flaring over the decades.[23]Furthermore, unauthorized gas flaring is only punishable by a fine of not less than one hundred million shillings or a jail term of not less than ten years or both.[24] Other than these provisions in the Act, there are no other real efforts being

[13] Article 69(1)(a), *Constitution of Kenya* (2010).
[14] Article 69(1)(g), *Constitution of Kenya* (2010).
[15] *Rio Declaration on Environment and Development.*
[16] *Environmental Management Coordination Act*, (Cap. 387 Laws of Kenya).
[17] Section 3(1), *Environmental Management Coordination Act*, (Cap. 387 Laws of Kenya). See also Article 42, *Constitution of Kenya* (2010).
[18] Section 3, *Climate Change Act* (Act No. 11 of 2016).
[19] Section 62(1), *Petroleum Act*, (Cap. 308 Laws of Kenya).
[20] Section 62(2), *Petroleum Act*, (Cap. 308 Laws of Kenya).
[21] Sections 59(k) and 62, *Petroleum Act,* (Cap. 308 Laws of Kenya).
[22] Bienen L, 'Nigerian Communities Demand End to Gas Flaring', 3(6) *Frontiers in Ecology and the Environment*, 2005.299.
[23] Kassim-Momodu M "Gas re-injection and the Nigerian Oil Industry", Vol. 6, *The Journal of Private & Property Law*, 1986, 69-90.
[24] Section 62(7), *Petroleum Act,* (Cap. 308 Laws of Kenya).

done to curb the process, despite the fact that in other countries, it has been deemed illegal and a fundamental breach of human rights.[25]

The definition of sustainable development has been oft-cited to be "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[26] As a result of the harmful effects of flaring towards the environment, the process cannot reasonably be seen as appertaining to the principles of sustainable development in relation to the environment. Flaring and venting of associated gas has negative effects on the environment including contamination of the atmosphere, soil contamination through precipitation of acid rain, and many other negative physical, chemical and biological effects.[27]

Statement of the research problem

Gas flaring has numerous harmful effects towards the environment . Despit e this, the Petroleum Act is permissive towards gas flaring through Sect ion 62(1) of the Petroleum Act . [28]This is despite the fact that through Sect ion 59(2)(k), it tries to expressively limit gas flaring. Wit hout modificat ion and clarificat ion, the effect of Sect ion 62(1) is facilitat ive of flaring rather than a deterrent . Therefore, this paper poses the problem that Section 62(1) serves as a loophole by which flaring can easily occur.

Statement of objectives

The paper seeks to prove that the permissive nature of Section 62(1*)* of the Petroleum Act creates a loophole in which gas flaring can easily occur. It therefore also seeks to show how the current legislation can be advanced in discouraging gas flaring to block the loophole.

Hypotheses

The hypotheses to be tested by the research include:

[25] *Gbemre v Shell Petroleum and Development Company Ltd* (2005), The Federal High Court of Nigeria (unreported). The decision is evidence of a shift in judicial attitude, from placing greater premium on revenue from petroleum exploration and exploitation activities over environmental protection.

[26] Our Common Future ('Brundtland report') (21 May 1987) by Gru Brundtland, Mansour Khalid, Susanna Agnelli, et al.

[27] Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta'.

[28]This Section permits gas flaring so long as it is under the supervision of the Ministry of Petroleum and Mining, in consultation with NEMA.

1. The permissive nature of Section 62(1) of the Petroleum Act creates a loophole in which gas flaring can easily occur.
2. Applying compulsory carbon taxes on flared gases will discourage gas flaring.
3. If alternative compulsory measures in dealing with associated natural gas are imposed on IOCs to deal with associated natural gases, flaring would then be limited to emergency situations and hence a clean and healthy environment for the extractive environs.

Research Questions

This paper poses to answer the following questions:

Is the nature of the Petroleum Act facilitative towards gas flaring?

Do the regulatory authorities in Kenya have the sufficient capacity to manage gas flaring given their consenting power?

Is the application of permanent non-exclusive sanctions on flared gas a more effective method to discourage gas flaring?

Justification/Significance of the Study

The study is founded upon the potential of contractors to use the country's relatively permissive legislation on gas flaring to carry on with the process so long as it is under the authority of the relevant regulatory bodies. This is in spite of the harmful effects of gas flaring towards the environment. It largely contributes to global climate change and has significant effects on the environment.[29] The harmful effects lead to degradation of the environment rather than the sustainable development of it, thus the need to discourage process by applying more stringent laws.

Literature Review

The oft-cited definition of sustainable development is development that meets the basic needs of the present without compromising the future generations' capacity to attain their basic needs.[30]As per the WECD, "basic needs" have been specified as "the essential needs of the

[29] Ayansina, A., O. Orimoogunje, T. Akinkuolie, and A. Odiong, "Perception on Effect of Gas Flaring on the Environment," 2(4) *Research Journal of Environmental and Earth Sciences* 2010, 188-193.
[30] Emas R, 'The Concept of Sustainable Development: Definition and Defining Principles' Global Sustainable Development Report 2015, -https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015- on 30 December 2019.

world's poor, to which overriding priority should be given."[31] However, despite many pervasive debates, there still is no general consensus on the most appropriate definition of basic needs.

For example, while some people hold on to the perspective that the satisfactory attribution of basic needs would only be ensured by meeting a specific survival threshold in terms of food, water air and shelter, others are strong proponents of the view that the term "basic needs" goes beyond mere biological subsistence and includes, inter alia, a minimum level of affection, understanding participation and freedom.[32]

The former interpretation is what has been majorly applied into practice as it has been taken to be more encompassing, through the consumption of private goods as well as services provided for and by the community at large.[33]The rationale behind this is that if the goods are not available to a person at least to a certain extent, the person will suffer and may even die. Furthermore, it has been proven that those needs are set on the basis of scientific findings that they are finite, classifiable and the same across all cultures and in all historical periods.[34]In other words, basic needs are objectively given and uniform across generations.

Putting this into context, maintaining a clean and healthy environment ensures that these basic needs are met and only through the notion of sustainable development, can the health of the environment be kept at a high standard for both present and future generations to meet their basic needs. Failing to effectively discourage flaring on the other hand, would be consequentially detrimental to maintaining that high health standard of the environment and therefore would add to the finite capacity of those basic needs.

Several research works on the impact of gas flaring exist but not many have narrowed their focus on the reasons and the social cost – benefit analysis of flaring. The study discusses not only the environmental consequences of flaring and venting of associated gas, but will make a list of proposals for abatement which gives a fresh perspective on the topic, in relation to the current Kenyan legislation. Researchers and scholars have published works from different

[31]World Commission on Environment and Development, *Our Common Future*, 1987,43.
[32]Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability' University of Lüneburg Working Paper Series Number 234,2014,5 -http://dx.doi.org/10.2139/ssrn.2026820 – on 2 January 2020.
[33]Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',5.
[34]International Labour Organization (ILO), *Employment, Growth and Basic Needs: A One-World Problem*, 1976,33. See also, Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',5.

perspectives of natural resources sustainability and environmental economics, and all acknowledged that gas flaring poses a danger to the environment.

Ite and Ibok explained that flaring and venting of associated petroleum gas in the Niger Delta contribute about 35 million metric tons yearly of carbon dioxide (CO2), methane (CH4) and other forms of GHGs to the region's atmosphere.[35] They found that gas flaring contributes to the poor environmental quality and severe human health issues in areas close to the flare sites.[36] The empirical results (consistent with the results of other related studies) suggest that gas flaring contributes to the global climate change and hurts environmental sustainability.[37] Pamela Stokes observed that acid precipitation that leads to acidification is a rising problem that reduces the species richness of an area.[38] Further research by Christiansen and Haugland found that the issue of flaring has an impact on agriculture and natural forest resulting to ecosystem heat stress and acid rain that accelerate the destruction of freshwater and forest resources.[39]

There is an acknowledgment that good legal and regulatory frameworks help most developing countries promote sustainable development of the environment.[40] Furthermore, the issue of a good legal and regulatory frameworks is central to the petroleum sector, with regard to its sustainability and diversification of its economic resources, in any country. In this regard, laws and regulations put in place should aim to boost the needed resource development and management.[41] In the petroleum industry, the principal method of gas flaring regulation is to develop rules that are in compliance with conservation practices. It has been noted that conservation involves responsible development of natural resources in a manner most beneficial to the present generation and posterity.[42]

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[35] Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta'.

[36] Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta'.

[37] Ayansina, A., O. Orimoogunje, T. Akinkuolie, and A. Odiong, 'Perception on Effect of Gas Flaring on the Environment.'

[38] Stokes P, 'Ecological effects of acidification on primary producers in aquatic systems' 1(2) *International Journal of Environmental Pollution*, 1986, 421-438.

[39] Christiansen A and Haugland T, Gas Flaring and Global Public Goods," *FNI Report* 20/2001, Fridtjof Nansen Institute (FNI), Lysaker, 2001.

[40] M Armstrong, *A Handbook of Human Resource Management practice*, Crest Publishing, London, 2003,12.

[41] Tadeo E, 'A Comparative Study of Oil Resource Management in Norway and Nigeria: Lessons for Kenya' Unpublished LLM Thesis, University of Nairobi, Nairobi, 2016,26.

[42] Odumosu I, 'Transferring Alberta's Gas Flaring Reduction Regulatory Framework to Nigeria: Potentials and Limitations' 44(4), *Alberta Law Review*, 2007, 862.

On one hand, gas flaring regulations that stipulate permanent consequences as a result of the process, are more effective towards discouraging gas flaring. In Norway, for example, the Carbon dioxide (CO2) Tax Act and the tax on Nitrogen oxide emissions are applicable to petroleum activities.[43] Furthermore, petroleum activities are subject to quota obligations.[44] These have been seen to be very effective in that Norway has one of the lowest flaring rates globally. This is despite the fact that it is one of the largest oil producing countries in the world.

On the other hand, gas flaring regulations being permissive towards flaring creates incentive to continue flaring. An example is how the Nigerian government pushed the deadline for oil companies to stop flaring to 2020.[45] This has been seen to motivate the companies to make the most out of the opportunity. As a result, Nigeria has one of the highest flaring rates globally.[46] Thus such legislation can be used as loopholes for oil companies to maximise on gas flaring.

Gas flaring is a resource management problem that could be utilized economically.[47] Christiansen and Haugland noted that gas burning is a waste of resources that have a potential economic value representing great resources management problem.[48] The implication is that the energy deficit faced by Kenya can be solved by harnessing the associated petroleum gas that has potential to be flared. The continued shortages in power generation capacity and frequent outages translate to economic losses and untold human hardship. The huge economic loss from flaring and venting of associated gas could be converted into corporate profit and government revenue by using appropriate technological solutions.[49]

Research design and Methodology

The design of this research will consist of three major stages. These are the study, the methodology, and the results and analysis. As part of the study, a thorough literature review

[43] These taxes are paid per standard cubic metre (Scm) of gas burned or released directly and per litre of petroleum burned.
[44] Thomson P and Derrick J, *The International Comparative Legal Guide to: Oil and Gas Regulation 2018*, 13th ed, Global Legal Group, London, 2018.
[45] Abraham E, 'A comparative analysis of the legal framework for the regulation of gas flaring in Nigeria and Norway' Unpublished LLM Thesis, University of the West of England, Bristol,2018.
[46] Ite A and Ibok U, 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta'.
[47] Osuoha C, 'Gas Flaring in Niger Delta Region of Nigeria: Cost, Ecological and Human Health Implications' 6(2) *Environmental Management and Sustainable Development*,2017,393.
[48] Christiansen A and Haugland T, Gas Flaring and Global Public Goods," *FNI Report* 20/2001, Fridtjof Nansen Institute (FNI), Lysaker, 2001, 34.
[49] Osuoha C, 'Gas Flaring in Niger Delta Region of Nigeria: Cost, Ecological and Human Health Implications' 6(2) *Environmental Management and Sustainable Development*,2017,393.

has been carried out on gas flaring to understand the problem at hand and the literature review proceeded to the expected means of solving the problem. This study will implement case-study research pattern whereby it will analyse the effects flaring and venting of associated gas in upstream petroleum operations on local communities in Nigeria's Niger Delta. These cases will guide the identification of the remote causes/reasons for gas flaring globally and in Kenya. To successfully do this, the study will apply documentary analysis and literature review as means of data collections. From the results of the study, a flared gas reduction framework will be developed, in order to help curb the process of flaring and venting of associated gas in the country.

Limitation s

The various limitations faced when working on this dissertation include:

1. The time limit to conduct the study is limited to approximately a year.
2. Lack of primary research which can be conducted, because a majority of the information collected is based on desktop research.
3. The limited amount of up to date resources with a considerable number of sources being written around 10 years prior to this research.

Chapter Breakdown

Chapter 2: An illustration is portrayed of how venting and flaring of natural gas is contrary to the concept sustainable development of the environment, highlighting the potential risk of the process if the legislation does not do enough to discourage it.

Chapter 3: An assessment of the Kenya's current legislation in relation to gas flaring as to and whether it does enough to discourage the process or whether it facilitative towards it.

Chapter 4: A comparative analysis of the paradox created based on Nigeria's experience and the experiences of developed countries such as Norway which employ more stringent anti-gas flaring laws.

Chapter 5: Conclusions and recommendations of the study

Duration

This study is set to run from July 2019 to January 2020.

CHAPTER TWO: CONCEPTUAL FRAMEWORK

This paper is founded on the concept of sustainable development, which was developed as a result of the need to address the growing concern over the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development.[50]

Sustainability is a broad concept of justice that has globally been accepted, as it combines intergenerational and intergenerational equity, and it includes justice towards nature.[51] It applies a mixed anthropocentric and eccentric perspective in its generally accepted definition: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[52] The term "generation" was incorporated here to mean all human beings living within the same time period. It therefore follows that to realize sustainability, there is an implication of at least two obligations attributed to presently living persons: the former directed towards the present generation and the latter towards future generations.

Albeit somewhat vague, this concept of sustainable development aims to secure economic advancement while ensuring that the long-term value of the environment is not tampered with.[53]Therefore, the notion of sustainability calls for a balance between its result-oriented aim; the satisfaction of basic needs of the present generation, and its prerequisite oriented aim; the maintenance of the future generation's ability to also satisfy its basic needs.[54]

Acting sustainably thus means taking specific actions in accordance with the standard procedures of the concept in a concrete action context,[55] that is, there is an expectation to act in a manner that ensures fulfilment of the legitimate claims the concept brings forth. An action context is characterized by a set of feasible actions, given system structure and dynamics, and knowledge of the system. Due to the limited level of knowledge of the system and feasible actions, it is essential that there is a harmonization of the general and abstract imperative to act sustainably and the specific action context.[56]

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[50] The UN Environment and Development Conference, 1992, also called the Rio Summit or the Earth Summit.
[51] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',4.
[52] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',4.
[53] Emas R, 'The Concept of Sustainable Development: Definition and Defining Principles' Global Sustainable Development Report 2015, -https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015- on 30 December 2019.
[54] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',5.
[55] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',2.
[56] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',2.

By critically analysing the definition given of sustainable development, the process of flaring and venting of associated gas in upstream petroleum operations is actually against the principles set out by the doctrine due to its negative harmful effects towards the environment.[57]The Millennium Institute developed "The Threshold21 (T21) Sustainable Development Model" which brings together economic, resource, population, social, and environmental issues in an integrated framework. With respect to the environment, it measures development in relation to how development of the environment will be influenced over the next twenty years, if policies shift investments toward development of the environment.[58]Based on the 'influence-on-the-environment test', flaring and venting of associated gas is seen to influence the environment negatively and cannot possibly lead to sustainable development of the environment.

Sustainable development in relation to the environment and in specific, to the prevention of flaring and venting of associated natural gas is premised on the following:

1. **Ethical paradox theory**

On one hand, 'sustainability' is seen as a characteristic of a process or state that can be maintained indefinitely. On the other hand, development is environmental modification, which requires deep intervention in nature and exhausts natural resources.[59]

This paradox is represented in the definition of Sustainable Development in the Brundtland Report, which deemphasizes the environment while underlining human needs to be realized through development.[60] The concept of sustainable development aims to mitigate and moderate the paradox created between the two.

Sustainable development has also been articulated as a discourse of ethics. '*Our Common Future*' concludes that, "human survival and well-being could depend on success in elevating sustainable development to a global ethics."[61]

These viewpoints of sustainable development express the tension between the goals for economic development and sustainable development. Putting this into context, the Petroleum

[57] Doric B and Dimoski V, 'Managing petroleum sector performance – a sustainable administrative design.' 31(1) *Economic Research-Ekonomska Istraživanja*, 2018.
[58] Millennium Institute, Threshold 21 (T21) Overview, Internal report, 2005.
[59] Jabareen Y, 'A New Conceptual Framework for Sustainable Development' 10(10.1007/s10668-006-9058-z) *Environment, Development and Sustainability* 2008, 181.
[60] Our Common Future ('Brundtland report'),1987.
[61] Our Common Future ('Brundtland report'),1987.

Act expresses this paradox with the paradox it presents. Therefore, approaching sustainable development from these ethical standpoints, there should be an attempt to reconcile this paradox and to address the dialectical relations between development and sustainability.[62] This would be best done by first eliminating the contradiction created by the Petroleum Act.[63]

2. The concept of responsibility

There are three different notions of responsibility when looking at its philosophical perspective. This is due to the fact that it has a multifarious character and through these meanings, it encompasses the nature of sustainability.[64]

The first aspect is the ascription of some action and its consequences to the perpetrator. It infers that the consequent change in the state of the world is an effect of a person's or a group of people's actions.[65] For example, harmful impacts towards the environment should be taken as a consequence primarily effected by human actions, and thus persons should be held responsible for those actions.

The second aspect views responsibility as a synonym for "obligation." The major reason for these obligations are legitimate claims that a claim holder has due to the overarching principles of natural justice. With specific regard to sustainable development, there exists a positive responsibility or obligation to satisfy the basic needs of the present generation and a negative responsibility, namely not to compromise the ability of future generations to satisfy their basic needs.[66]

The last aspect is that the concept of responsibility is important whenever a person is facing a plurality of normative obligations or duties, which may conflict with each other.[67] Its relevance to sustainable development is linked to that of the ethical paradox theory, in that, the notion of sustainability has two, potentially conflicting obligations: satisfying the basic needs of the

[62] Jabareen Y, 'A New Conceptual Framework for Sustainable Development', 182.

[63] *Section 59(2)(k)* of the Petroleum Act provides that a contractor shall take all reasonable steps to prevent from flaring or venting of oil and natural gas by undertaking all reasonable steps including the harnessing or re-injecting of the gas. *Section 62(1)* then goes on to state that a contractor shall not vent or flare natural gas in the course of the conduct of upstream petroleum operations except with the prior authorization of the Authority in consultation with the National Government agency responsible for environment and safety and any other National Government entity. The contradiction is created in that it is left up to these agencies to authorize the process without having to abide to a standard criterion.

[64] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',6

[65] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',6.

[66] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',7.

[67] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',7.

present generation and not compromising the ability of future generations to satisfy their needs.[68]

In a nutshell, the notion of responsibility encompasses the consequences of a person's actions, as a result of facing an obligation to fulfil legitimate and potentially conflicting claims that may arise. A utilitarian notion of responsibility for sustainability can thus be said to arise as the concept is viewed from the point of maximum utility.[69]

3. The concept of natural capital stock

Natural capital here is viewed as the capacity of natural systems to absorb the emissions and pollutants which arise from human actions without suffering from the side effects which imply heavy costs to be passed on to future generations.[70]

Within the discourse on sustainable development, constant natural capacity is requirement in the fulfilment of sustainability. In this sense, sustainability means that the stock of capital should not decrease in order to endanger the opportunities of future generations to create wealth and well-being.[71] Therefore, the harmful effects of the environment, as a result of flaring and venting of associated natural gas can be seen to directly connote a decrease in stock of capital and thus should not occur in order to achieve 'strong sustainable development.'

4. Utopian Theory

Utopias related to sustainable development imagine a perfect society where justice prevails, people are perfectly content, people live and flourish in harmony with nature, and life moves along smoothly, without abuses and shortages.[72]The power of utopian thinking, properly conceived as a vision of a new society that questions all the presuppositions of present-day society, is its inherent ability to see the future in terms of new forms and values.[73]

Permitting gas flaring is contrary to this perspective as it disrupts the harmony with nature and develops abuses together with shortages, in relation to the environment.

5. Precautionary Principle

[68] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',7.
[69] Fünfgelt J and Baumgärtner S, 'A Utilitarian Notion of Responsibility for Sustainability',11.
[70] Jabareen Y, 'A New Conceptual Framework for Sustainable Development'182.
[71] Jabareen Y, 'A New Conceptual Framework for Sustainable Development'182.
[72] Jabareen Y, 'A New Conceptual Framework for Sustainable Development'183.
[73] Jabareen Y, 'A New Conceptual Framework for Sustainable Development'184.

The precautionary principle is one of the fundamental principles underlying environmental policy, as it raises issues central to the environment, sustainable development and biodiversity. It has been termed "a safeguard for future generations."[74]This is so as it provides a shield against serious, and potentially irreversible harm to the natural resource base that might jeopardise future generations' capacity to provide for their needs. In this way, it is linked to inter-generational equity, and part of the overarching concept of sustainable development.[75] Many countries have incorporated the principle into general environmental, biodiversity and natural resource law and policy.

It is generally viewed as a mechanism to counter widespread regulatory presumption in favour of allowing development activities to proceed when their economic benefits or other external factors outweigh their harmful impacts on their environment.[76]Implementation of precaution involves a balancing between the interests of biodiversity and resource conservation, and other countervailing pressures such as economic interests.[77] Therefore, applying precaution will usually involve restrictions on human actions. In other words, it essentially states that if there is a chance of harm being done to the environment from an activity, then it should be precluded or heavily regulated.[78]

The precautionary approach is applied in various ways, and a wide range of formulations exists. Different regulations existing in different countries may show varying levels of risk-awareness, due to their different objectives in relation to protection of the environment.[79] Formulations of the principle vary from weak to strong, and from those which impose obligations to those which empower decision-makers to take precautionary action.[80]However, common characteristics present in these formulations include the use of language that limits activities in which there are threats of serious or irreversible harm, consideration of the cot-effectiveness of precautionary actions, and a shift of burden of proof to demonstrate lack of harm, to the proponents of activities.[81]

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[74] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management: An issues paper for policy makers and practitioners*, IUCN, Gland, Switzerland and Cambridge, United Kingdom, 2004,2.
[75] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management*,2.
[76] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management*, ix.
[77] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management*, x.
[78] Lawrence D, 'Exxon Mobil and the Precautionary Principle' Energy Policy Forum, 18 January 2013 - https://www.resilience.org/stories/2013-01-18/exxon-mobil-and-the-precautionary-principle/ on 15 December 2019.
[79] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management*, x.
[80] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management*, ix.
[81] Cooney R, *The Precautionary Principle in biodiversity conservation and natural resource management*, x.

The principle should be considered by all participants in the consenting process. Regulators and IOCs have a particular responsibility as their remit lies at the heart of the precautionary principle.[82]In the oil and gas exploration and production industry, integration of environmental consideration into development planning is an effective way of applying this principle. Thus, with regard to gas flaring, placing heavy and strict regulations upon the process is the most effective way of satisfying the conditions set out by the precautionary principle.

Applying a mandatory carbon tax on flared gases for example, is a strong formulation of the principle as it would heavily restrict gas flaring as it involves constant incorporation of proportionality between level of risk of the activity towards the environment and measures adopted to curb that risk. The more an IOC intends to flare gases, the higher carbon tax would have to be paid, as the reason behind the flaring becomes irrelevant. Leaving the authorization of the activity to the authority in charge on the other hand, is a weak formulation as it leaves the act of balancing the environmental interests and economic interests upon very few individuals, whose decisions may end up being detrimental to the environment.

82 Hitchin B,' The Precautionary Principle Inside and Outside Marine Protected Areas' Joint Nature Conservation Committee -< https://oilandgasuk.co.uk/wp-content/uploads/2015/09/The-Precautionary-Principle-inside-and-outside-Marine-Protected.pdf>- on 15 December 2019.

CHAPTER THREE: THE FACILITATIVE NATURE OF KENYA'S PETROLEUM ACT TOWARDS GAS FLARING

In as much as Kenya has fairly adequate environmental and EIA policies and, much of the emphasis is on project approval processes, rather than on a life cycle approach to minimizing environmental and social impacts at the strategic level.[83]This means that more effort is directed at granting approval to proceed with and gas projects than to considering the long-term impacts of those projects,[84]as it is not unusual for governments to devote more attention to economic benefits from short-term gains within their mandate than to consider their long-term impacts. Furthermore, actual enforcement is inadequate, environmental monitoring is insufficient and monitoring data is not widely disclosed to the lead agencies, public and affected stakeholders.[85] This is so because the country has insufficient control and enforcement mechanisms during the post EIA approval phase due to limited technical capacity.

Consequently, the effectiveness of the existing environmental policy and frameworks tend to be compromised by the lack of a sufficiently organized administrative structure that would ensure efficient regulatory compliance and enforcement.[86]This is majorly due to the fact there are insufficient resources needed for effective environmental governance. In addition to this, regulatory duties are not only disjointed in terms of focus, but they are also scattered across various government agencies at both national and county levels; clear environmental governance structures not present due to the ongoing transition to a devolved system in the country.[87]

The Petroleum Act adopts this approach of emphasizing on the project approval process, as it barely imposes detailed requirements for environmental control programs.[88] For example, there are no regulatory guidelines for defining contamination limits.[89] In the absence of such guidelines, it is impossible to define how contamination should be cleaned up and future level

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[83] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 73.

[84] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 73.

[85] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 73.

[86] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 188.

[87] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 189.

[88] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 192.

[89] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 193.

of impact.[90] Moreover, there is an inadequate application of environmental standards and guidelines for upstream oil exploration and production activities, other than the general principles of environmental law, in order to meet international environmental quality thresholds and international air quality thresholds. There is also no specific department in NEMA exclusively mandated to handle oil and gas environmental issues, in addition to the authority's staff lacking the required capacity to undertake technical review and provide the advice expected by the IOCs.[91]This lessens the requirements to be met in relation to protection of the environment, for the Cabinet Secretary for the Ministry of Petroleum and Mining to approve a project.

With regard to gas flaring, there are no specific guidelines or technical manual on management of the environmental impacts of the activity. Exposures to hazards as a result of gas flaring in the oil and gas industry have also not been addressed under the OHSA of 2007. Without such guidelines there is difficulty in understanding responsibilities and enforcement procedures in managing gas flaring.[92]

Section 59(2)(k) states that a contractor shall prevent from flaring or venting of oil and natural gas by undertaking all reasonable steps including the harnessing or re-injecting of the gas.[93] This cannot be said to be sufficiently effective to discourage flaring, as the country lacks the capacity and infrastructure to harness or reinject associated natural gas.

However, both the Petroleum Act and the Model PSC have inadequate provisions for natural gas fiscal terms. This makes it extremely challenging to economically develop a natural gas industry based on oil-backed fiscal terms.[94] Moreover, the lower wellhead price of natural gas, be it caused either by having to compete with lower cost alternative fuels in the domestic market or as a result of lower netback prices into the export markets and longer project lead times.[95]

With regard to reinjection of the gas, there are also no specific provisions or guidelines as to how the gas is to be reinjected and which authority is responsible for overseeing the process.

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[90] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 193.
[91] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 195. See also Kering N,' NEMAS capacity to manage and control the potential environmental impact of the emerging oil and gas sector' Unpublished LLB Thesis, Strathmore University, Nairobi.
[92] Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 195.
[93] Section 59(2)(k), *Petroleum Act*, (Cap. 308 Laws of Kenya).
[94] Ministry of Energy and Petroleum, *National Energy and Petroleum Policy*, 2016,27.
[95] Ministry of Energy and Petroleum, *National Energy and Petroleum Policy*, 2016,27.

There also lacks the infrastructure to effectively reinject the gas back to its source. Without these Section 59(2)(k) is majorly unenforceable.

Section 62(1) then goes on to state that a contractor shall not vent or flare natural gas in the course of the conduct of upstream petroleum operations except with the prior authorization of the Ministry of Mining and Petroleum in consultation with NEMA.[96] Section 62(2) provides that a contractor shall carry out the venting and flaring in accordance with the terms and conditions of the consent, existing laws and best petroleum industry practices.[97]

These two Sections bear the presumption that contract clauses on the environment will be reviewed by highly experienced and competent legal environmental experts at the Ministry for Petroleum and Mining and NEMA, before final agreements are signed.[98] However, this competency standard is challenged by the limited financial, technical and human capacity of the Ministry, NEMA, County Governments and other relevant government agencies like the Kenya Forest Service (KFS), Kenya Maritime Authority (KMA) and Kenya Wildlife Service (KWS).[99]

NEMA, for example, has not developed an efficient Environmental Management and Information System (EMIS) to the expected international levels due to the aforementioned limited resources. This deprives NEMA and other lead agencies of the opportunity to take advantage of an information technology solution for tracking environmental data as part of their Environmental Management System (EMS).[100]There also lacks a National Environmental Laboratory which would serve as an effective basis for the EMIS by providing internationally accredited analytical laboratory services.

The Act provides some mandatory requirements together with possible penalties if those requirements are not met. An IOC can only carry out flaring and venting in accordance with terms and conditions of the consent, existing laws and best petroleum industry practices.[101] Moreover, the IOC must ensure that the gas flaring or venting is kept at the lowest possible level and must also inform the Ministry of Petroleum and Mining of the circumstances requiring such action. Any application to the Ministry in respect of proposed flaring has to include an evaluation of reasonable alternatives to flaring that have been considered along with

[96] Section 62(1), *Petroleum Act*, (Cap. 308 Laws of Kenya).
[97] Section 62(2), *Petroleum Act*, (Cap. 308 Laws of Kenya).
[98] PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,260.
[99] PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,260.
[100] PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,263.
[101] Section 62(2), *Petroleum Act*, (Cap. 308 Laws of Kenya).

information on the amount and quality of the gas flared. Failure to abide by these provisions of the Act creates a liability to a fine of not less than one hundred million shillings or a jail term of not less than ten years or both.

These guidelines given in Section 62 are not capable of effective enforcement as there are no primary technical procedures and standards on the circumstances and actual disposal of upstream oilfield and offshore waste from gas flaring and venting, other than what s provided for in the Act. Development of these flaring guidelines has been scarce especially with regard to flaring and venting waste classification and tracking, as environmental waste management has been majorly left under the mandate of the County Governments post-devolution, yet there are inadequate capacity building procedures for the devolved institutions in terms of gas flaring.

In as much as there is the requirement that a contractor has to inform the Ministry and NEMA of the circumstances surrounding the flaring and venting, the primary basis of authorizing the process is the subjective consent of the Ministry. This is so because there are no set out circumstances where gas flaring is permitted; it is up to those responsible at the Ministry and NEMA to decide whether the circumstances are sufficient or not and therefore, it would be difficult to decide on those circumstances from an objective point of view. This is a clear issue considering that there is a lack of sufficient capacity of staff in those institutions, coupled with the aforementioned fact that little has been done by those institutions in terms of development of technical guidelines dealing with flaring and venting.

With regard to the possible penalties for contravening the above Sections of the Act,[102] it is widely accepted that the major factor for the effective application of environmental legislation is the presence of appropriate sanctions for their enforcement. The first issue with the sanctions posed by the Act is that the contractor would be a company, as a legal entity. Therefore, imposing criminal sanctions, that is, a possible jail term, would be extremely difficult to apply. Determining who the individual perpetrators would thus be a long and arduous process as every contract entered into at every stage is between the government and the IOC or NOC. Another issue that persists, is the little deterrent effect brought out by the one hundred million fine if the provisions of the Act are contravened. This penalty is too low to provide an appropriate

[102] Section 62(7), *Petroleum Act*, (Cap. 308 Laws of Kenya).

disincentive. Furthermore, the revenue raised by such a penalty potentially gives the government a disincentive to set them high enough to actually eliminate that revenue stream.[103]

It is thus apparent that application of the best petroleum standards with regard to discouraging and managing the flaring and venting of gas is virtually impossible due to the lack of the required infrastructure and capacity of the stakeholders in the country. The international guidelines become mere recommendations that do not have a strong basis for implementation.

Summarily, in as much as the Petroleum Act tries to discourage flaring and venting of gas, its provisions assume a facilitative nature towards the process. They do very little to deter oil companies from partaking in gas flaring. Moreover, they place too much power on the Ministry and NEMA to give consent to the process instead of pushing for an adoption of well set out objective guidelines for managing the process. This issue is augmented by the limited technical and financial capacity of the Authorities responsible for managing the potential harmful environmental impacts of gas flaring. As a result of this permissive nature, the Act does not effectively meet the sustainable development standard set out by the Constitution and other ratified international treaties.

[103] World Bank Group, Government of Norway, 'Global gas flaring reduction initiative: Report on consultations with stakeholders' World Bank Working Paper Number 27275,2004,35 - http://documents.worldbank.org/curated/en/297051468762607776/Report-on-consultations-with-stakeholders on 30th December 2019.

CHAPTER FOUR: THE NIGERIAN AND NORWEGIAN EXPERIENCE WITH GAS FLARING

Nigeria

Nigeria has been estimated to be second largest gas-flaring nation in the world after Russia. It is estimated that about 20%-40% of its associated gas production was flared in 2013, amounting to $2.5 million USD, thereby contributing to 10% of the total gas flared annually.[104] This has made it one of the countries that have faced a lot of damage from the petroleum sectorial activities, especially around the Niger Delta region.[105]

Successive Nigerian Governments have tried to adopt a strict hard-line stance of prohibiting flaring by means of legislation while imposing penalties, fines, and environmental taxation as a means of discouraging the practice.[106]However, absence of effective and efficient legal and regulatory mechanisms for monitoring and enforcing compliance of the law, coupled with under-developed infrastructure to effectively manage gas flaring, have led to sub-optimal outcomes in Nigeria's effort to combat flaring and venting.[107]

The difficulty in combating flaring and venting of gas in Nigeria is also facilitated by the facilitative nature of its petroleum regulations. In as much as the Nigerian Government has persistently enacted laws prohibiting flaring, these regulations provide a relatively wide exemption to the contrary.[108]Such a framework is inherently flawed as it has failed to achieve its ultimate objectives. Thus, it has widely been argued that through deficiencies and loopholes in the framework, the legislation has created a vacuum that oil companies use to manoeuvre and obtain contracts and licenses by simply claiming that harnessing or reinjection of the gas is not feasible.[109]

The high level of environmental damage versus inadequate infrastructure and operational facilities has caused tensions amongst local communities, oil companies and environmental

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[104]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria' 2(9) *Imperial Journal of Interdisciplinary Research (IJIR)*, 2016,1252.
[105]Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 192.
[106]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria',1252.
[107]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria',1252.
[108]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria',1253.
[109]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1253.

and human rights groups.[110]The United Nations Environmental Programme (UNEP) released a study on Ogoniland and the extent of environmental damage which confirmed that it would take 25-30 years to repair and would be one of the world's most extensive and wide-ranging oil clean up exercise.[111]The goals of sustainable development have thus become very difficult to achieve in the country, as a result of environmental damage having adverse negative impacts on local livelihoods.[112]

Furthermore, Nigeria, despite holding some of the world's largest reserves of natural gas, has thus far failed to develop an effective and robust domestic natural gas industry.[113]The gas market in Nigeria is a centrally controlled sector that has led to loose oversight and corruption issues. Its gas infrastructure faces numerous issues to the extent that development of natural gas projects has been mothballed or delayed.[114]The government did little to secure that infrastructure stating that it has apparent challenges in taking into account and effectively balancing the needs and desires of all key stakeholders.[115]

The Government also makes use of fixed prices which risks phasing natural gas out of the market, despite receiving strong opposition when increases and decreases are contemplated or attempted.[116]This method of fixed pricing has turned out to be unsustainable.[117]The low alternative gas prices that are set in comparison to the higher price of liquefied natural gas, deter investors and oil companies from developing the required the required gas infrastructure.

Norway

Norway is one of the significant oil producers in the world, and it is the largest holder of oil and natural gas reserves in Europe. It has provided much of the oil and natural gas consumed

[110]Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 192.
[111]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1253.
[112]Ministry of Energy & Petroleum, *Strategic Environmental and Social Assessment of the Petroleum Sector in Kenya*, 2016, 192.
[113]PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,214.
[114]PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,214.
[115]PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,247.
[116]PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,211.
[117]PWC Consortium, *Towards a Petroleum Master Plan for Kenya*,2015,211.

in Europe.[118] Despite this, the associated gas flaring volumes as a percentage of oil production has decreased substantially over the last few decades.[119]

The Norwegian authorities have always imposed strict regulations on petroleum activities. The legal measures for safeguarding the environment were well legislated since the activities started on the Norwegian Continental Shelf (NCS).[120]For example, permanent gas flaring was prohibited by the parliament under the parliamentary principles known as the 10 Oil Commandments which later formed the basis for the country's legal and regulatory framework.[121]

Perhaps the two most important pieces of legislation that were enacted in Norway to discourage gas flaring are the Petroleum Activities Act (PA) and The Carbon Tax Act.[122] The former induces a very strong deterrent to gas flaring by generally prohibiting the activity while providing very strict objective guidelines for exemptions during testing, whereas the latter has made oil companies to take a number of steps to reduce the associated gas flaring, due to the lower tax incentives it sets.[123]

The PA Act provides that burning of petroleum in excess of the quantities needed for normal operational safety shall not be allowed unless approved by the Ministry.[124] However, upon application of the licensee, the Ministry of Petroleum and Energy is empowered by the Act to stipulate the quantity that may be produced, injected or cold vented for a fixed period.[125] This section recognizes the need to flare gas for operational needs but still takes a tough line against the unnecessary flaring in a very precise and unambiguous manner.[126]

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[118]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1256. See also, Tadeo E, 'A Comparative Study of Oil Resource Management in Norway and Nigeria: Lessons for Kenya' 2016.

[119]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1256.

[120]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1256.

[121]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1257.

[122]Norwegian Ministry of Petroleum and Energy, *An industry for the future- Norway's petroleum activities,* (2010-2011) 5.

[123]Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1257. See also Tadeo E, 'A Comparative Study of Oil Resource Management in Norway and Nigeria: Lessons for Kenya' 2016.

[124]Section 22, *Regulations to Act relating to Petroleum Activities* (Royal Decree 27 Laws of Norway).

[125]Section 22, *Regulations to Act relating to Petroleum Activities* (Royal Decree 27 Laws of Norway).

[126]Kering N,' NEMAS capacity to manage and control the potential environmental impact of the emerging oil and gas sector' Unpublished LLB Thesis, Strathmore University, Nairobi.

Moreover, the Act also stipulates a condition that before any development of a discovery and operation of such discovered deposits, "a plan for installation and operation of the facility for transport has to be approved by the ministry of Petroleum and Energy".[127] This requirement makes the rule against flaring an operational policy, making it impossible to develop a project unless adequate provisions have been made for associated gas utilisation facilities.[128] This provision treats associated natural utilisation as an integral part of oil development and thus, can be suggested as placing the state on the offensive rather than defensive in its efforts to combat gas flaring.[129]

The success achieved by Norway can partly be attributed to its strong legal and regulatory framework for combating the practices and the strong political will on the part of the Norwegian authority to get rid of the menace.[130] The stringent restrictions on flaring under the PA Act has led to technological development and triggered measures that have yielded considerable emission reductions and keep the general flaring level on the NCS low, compared with the rest of the world.[131]

From the comparative analysis above, it is seen how government regulation really is the cornerstone for combating gas flaring because through it, oil companies can either be strongly deterred or heavily incentivised to carry out gas flaring. Furthermore, where the legislation is very clear and unambiguous with regard to associated gas utilisation, the deterrence procedures are much more efficient. For a country that has facilitative legislations towards gas flaring, discouraging it is a much tougher process.

[127] Section 22, *Regulations to Act relating to Petroleum Activities* (Royal Decree 27 Laws of Norway).

[128] Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1258.

[129] Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1258.

[130] Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1259.

[131] Mohammed J,' Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway – Lessons for Nigeria', 2016,1259.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

Findings on the nature of the Petroleum Act as to gas flaring

As discussed above, Kenya's legislation expressly calls for the prevention of flaring and venting of associated natural gas. It states that contractors have to take all reasonable steps in dealing with the associated gas. However, it has been seen that the effectiveness of the provision is hampered by the low level of infrastructure and insufficient capacity to harness or reinject the associated natural gas.

The issues surrounding harnessing of the gas are centred around the presence of inadequate provisions for natural gas fiscal terms and the lower wellhead cost of natural gas.[132]As has been mentioned in the paper, this has been caused either by having to compete with lower cost alternative fuels in the domestic market as a result of lower netback prices into the export markets and longer project lead times. With regard to reinjection of the gas, there are no specific provisions as to how the gas is to be reinjected. A further ambiguity is brought forth by the fact that there is no authority that is exclusively responsible for overseeing the process.

Looking at Nigeria's experience, it has failed to develop a robust natural gas industry, despite holding some of the world's largest reserves. Its legislation has also always called for the harnessing and reinjecting of associated natural gas, going as far as to enact the Associated Gas Re-Injection Act.[133]However, it has never secured the sufficient infrastructure to efficiently harness the associated gas for economic benefit. Norway, on the other hand, has made it almost impossible to develop a project unless adequate provisions have been put in place for associated gas utilization facilities.

Therefore, it is right to conclude that the current legislation in Kenya would do little to deter an oil company from flaring and venting associated gas as all they would need to prove is that the harnessing or reinjection of the gas is not feasible. Kenya should thus strive to follow Canada's example to promote effective discouragement of gas flaring.

Whether the regulatory authorities have the capacity to manage flaring and venting of associated natural gas, given their overarching consenting power

From the discussions in the paper, the consent given by those authorities, that is, The Ministry of Mining and Petroleum and NEMA, would be based more on subjective deductions of a given

[132] Wellhead price is the price less transportation costs.

[133] *Associated Gas Re-Injection Act* (Nigeria).

set of circumstances rather than objective ones, in addition to application of the basic environmental principles. There are no primary technical procedures and standards on the circumstances and actual disposal of the waste from gas flaring. Moreover, harmonization with the County Government's mandate of environmental management has been difficult to achieve as there are still inadequate capacity building procedures for the devolved institutions in terms of gas flaring.

Whether the application of permanent non-exclusive sanctions on flared gas is a more effective way to discourage gas flaring rather than conditional penalties

The Act has indeed provided for penalties and sanctions if associated gas is flared in a manner that is not in accordance with the terms and conditions of the consent given by the regulatory authorities, existing laws and best petroleum industry practices. The penalty includes a fine of not less than one hundred million shillings or a jail term of not less than ten years or both.

However, as discussed in the paper, imposing criminal sanctions on a contractor would be difficult as the contracts at each level of exploration, production and development are between the government and the oil companies, not individuals who work for those companies.

Moreover, a country like Norway, through its Carbon Tax Act, is able to circumvent this challenge by imposing permanent sanctions on flared gases, rather than only when the gas flaring regulations are contravened. This has been seen to make oil companies in the country to drastically reduce the level of flaring and venting, as that Act sets out lower tax incentives for the oil companies in this manner. In other words, what distinguishes Norway's legislation from Kenya's with regard to these penalties and sanctions, is that Norway places itself in the offensive rather than the defensive in its efforts to discourage gas flaring.

Recommendations

As a result of carrying out this research and analysing the variety of information stated throughout the study, the summary of recommendations is as follows:

1. Cultivation of clearer and less ambiguous provisions in the Petroleum Act in dealing with harnessing and reinjection of associated natural gas. Alternatively, an entirely separate legislation could be enacted for the specific utilization of that associated natural gas.

2. Ensuring that the Government allocates sufficient funding to both the Ministry of Mining and Petroleum and NEMA to enhance their financial, technical and technological capacities in managing the flaring and venting of associated natural gas.
3. Prescription of a permanent and compulsory carbon tax on flared gases to give lower tax incentives for oil companies which in turn would strongly discourage gas flaring.
4. Establishment of natural gas infrastructure to promote a robust natural gas market, which would render the lower wellhead price of natural gas irrelevant.
5. Encourage more capacity building procedures in the devolved institutions of the County Governments in relation to environmental management and conservation, not only in the petroleum industry but across the board, to promote sustainable development.
6. Establishment of an able institution within NEMA that is directly involved with the Ministry of Petroleum and Mining and is exclusively mandated to deal with environmental matters in the petroleum industry. This would increase the coordination between the two and enhance the level of expertise in NEMA when it comes to gas flaring.

Conclusion

The Constitution and other legislations in the country call for sustainable development for the environment. The petroleum industry plays a big role in attaining and maintaining this due to the activities carried out and their potential impacts on the environment. Gas flaring is one of the major procedures that can lead to drastic harmful impacts on the environment. Thus, the legal framework governing it should not lead the industry astray in matters of sustainable development of the environment.

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