

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/342663758>

Comparative Appraisals of Legal and Institutional Framework Governing Gas Flaring in Nigeria's Upstream Petroleum Sector: How satisfactory?

Article in *Environmental Quality Management* · July 2020

DOI: 10.1002/tqem.21680

CITATIONS

9

READS

220

2 authors, including:



Olusola JOSHUA Olujobi

Elizade University

41 PUBLICATIONS 223 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



UPSTREAM PETROLEUM SECTOR - CORRUPTION [View project](#)



Law of Tort [View project](#)

Comparative appraisals of legal and institutional framework governing gas flaring in Nigeria's upstream petroleum sector: How satisfactory?

Olusola Joshua Olujobi¹ | Temilola Olusola-Olujobi²

¹ Business Management Department, Covenant University, Ota, Nigeria

² Olujobi Olusola & Co. Lagos, Nigeria

Correspondence

Olusola Joshua Olujobi, Business Management Department, Covenant University, Ota, Nigeria
Email: olusola.olujobi@covenantuniversity.edu.ng

Funding information

Covenant University, Ota, Ogun State, Nigeria

Abstract

Nigeria is rated number one producer of crude oil in Africa, and owing to this oil exploration activities have resulted to a high rate of gas flaring, which was intensified by poor enforcement of anti-gas flaring laws by the regulatory authorities. Associated natural gas is generated from oil production, and it is flared in large volumes, thereby leading to the emission of greenhouse gases and a waste of natural resources which could have possibly generated billions of dollars for the Federal Government of Nigeria. There are concerned that if nothing is done to curtail this menace, the environment and man will be at peril due its negative consequences. There is therefore the need to abate gas flaring by replicating the strategies applied in the selected relatively advanced petroleum countries to combat the menace. The study is a comparative analysis of national legal regimes on gas flaring in Nigeria, Canada, the United Kingdom, and Saudi Arabia. The study adopts a doctrinal legal research method with point-by-point comparative approach with library-based legal research method. Weak enforcement of laws is largely identified as the key factor responsible for the menace. The study recommends the use of more advanced technologies, a sophisticated mixture of regulations and nonregulatory incentives such as fiscal policies and gas market restructuring. It offers further suggestions based on the lessons learnt from the selected case study countries.

KEYWORDS

Enforcement of Laws, Environment, Gas flaring, Global warming, Nigeria

1 | INTRODUCTION

Nigeria is endowed with enormous gas reserves of about 159 trillion cubic feet (tcf) of natural gas, and it is ranked one of the top 10 coun-

tries endowed with natural gas in the world (Orlando, 2006). It has an estimated 159 tcf of proven natural gas reserves. An approximately 2.5 billion cubic feet of gas is asserted being flamed by the numerous oil facilities in Nigeria (Oyewunmi, & Oyewunmi, 2016). Gas flaring is

the disposition of natural gas or associated gas that comes with crude oil during oil exploitation and exploration processes in the upstream petroleum sector.

Generally, gas flaring is an operational waste of energy resources in the petroleum sector that encourages greenhouse gas emissions. The 1992 United Nations Convention on Climate Change as well as the 1997 Kyoto Protocol require government to reduce greenhouse gas emissions in the oil sector (Malumfashi, 2007). However, gas flaring occurs in refineries, chemical plants, oil rigs, and landfills by fiery off the flammable gas. It also occurs when oil companies burn off the extra gas that escapes due to oil drilling and other oil-related activities in the upstream petroleum sector.

Numerous studies have shown that in relatively advanced petroleum countries like the United States, petroleum companies process natural gas or reinject the same into the field, and only 1% of the gas is flared unlike in Nigeria where over 60% of the associated gas is flared. This could have generated billions of dollars to the Federal Government's treasury through processing, distribution, use of such gas as cooking or industrial gas. This can also be used to generate electricity for the populace to end incessant power outage at the time the nation is experiencing persistent poor power supply and loss of oil revenues due to global oil price slump (Ojide, 2012). However, due to this among others, Nigeria is rated seventh highest gas flaring nation globally by the World Bank's Global Gas Flaring Reduction Partnership (Nigerian National Petroleum Corporation, 2017).

On the other hand, gas flaring being an international concern and major source of air pollution with deleterious effects on climate which have prompted various studies which have revealed that approximately 150 billion cubic meters (bcm) or 5.3 tcf of natural gas is burnt yearly with 400 million tons of emissions discharges annually. In Nigeria, approximately 800 million standard cubic feet (Mmscf) of gas is flared regularly in virtually 144 gas flare locations in Nigeria. The study has also revealed that oil company flared an aggregate of 301.69 billion standard cubic feet of gas in November 2016–November 2017 at the exchange rate of ₦360 to a dollar and the domestic supply obligation rate of \$1.50 per 1,000 standard cubic feet of gas, this means forfeiture of N162.912 billion revenues which could have accrued to the Federation account (The Nigerian National Petroleum Corporation Monthly Financial and Operations Report, 2017).

Furthermore, the existing legal framework that regulates gas flaring in Nigeria has remained ineffective due to poor enforcement and insignificant monetary penalties of ₦10 per thousand standard cubic feet imposed on the defaulters, and as result it has become inefficient in combating gas flaring. The Federal Government loses approximately \$1 billion of revenue to gas flaring every year due to

lack of infrastructure to commercialize flared gas in the sector (Fluenta, 2019). Besides, the need to regulate gas flaring, there is need to protect the environment from degradation, acute damage to the ecosystem as well as human health, and to generate more revenues to Nigeria from gas owing to the current declined in the global oil price.

Furthermore, the Petroleum (Amendment) Act of 1969 and Associated Gas Re-injection Act 1979 (as amended) enacted to combat gas flaring and other environmental pollutions by compelling petroleum companies to make available their plan for gas reinjections in Nigeria have not been implemented vigorously by the regulatory agencies in the sector to combat gas flaring. Gas flaring occurs in the oil-producing areas of Niger delta, and the Federal Government has made several attempts to combat gas flaring, but associated gases are still being flared without any efforts to preserve it. Most petroleum companies wrongly assume that they will not have copious financial profits from utilization and commercialization of associated gas in Nigeria. Gas flaring is also attributed to non-existence of modern or advanced technologies to utilize gas in Nigeria (Okorie, 2018).

It is also assumed that exploitation of associated gas or reinjection appear to be more costly than flaring due to lack of storage facilities for the associated gas at the rig site and owing to these among others reasons, petroleum companies operating in Nigeria prefer to flare gas because it is cheaper and due to the perceive low investments prospects on associated gas utilization due to the absence of sufficient incentives on gas utilization and poor gas infrastructure and also due to limited markets for gas trading in Nigeria. Regulation of gas flaring through legal and institutional framework is a global concern that now requires national efforts to combat at domestic level due to its deleterious consequences on individuals' well-being and on the environment (Otitolaju, 2010).

The objective of this study is to analyze the legal and institutional frameworks on gas flaring, to exterminate gas flaring, and to recommend practical measures for ending gas flaring in Nigeria. The paper is divided into five sections: section one comprises of introduction and Section two discusses statement of the problems, theoretical framework, and national legal regimes for combating gas flaring. Section three describes institutional legal framework and carries out comparative analysis of national legal regimes of Nigeria, Canada, the United Kingdom, and Saudi Arabia on gas flaring. Section five discusses factors militating against the effectiveness of national legal regimes for combating gas flaring in Nigeria with some practical lessons Nigerian can learn from the selected case study countries on how to combat gas flaring. The last section deals with the conclusion and recommendations.

Pictures of Gas flaring in Oil Facilities



Source: Nigeria's New Gas Flare Agenda 2019, available at Thisday online newspaper, <https://www.thisdaylive.com/index.php/2019/04/16/nigerias-new-gas-flare-agenda/> (accessed September 16, 2019)



Nigerian National Petroleum Corporation sets 2020 target to end gas flaring, available at <http://www.epiczone.com.ng/nnpc-sets-2020-target-end-gas-flaring/amp/> (accessed September 16, 2019)

2 | STATEMENT OF PROBLEMS

Crude oil being the main stay of Nigeria's economy with over 90% of its foreign exchange earnings from the sector has made it difficult for the Federal Government of Nigeria to enforce its anti-flaring laws stringently and consistently to avoid losing multinational oil companies patronage of its oil. This has affected diversification of its mono-economy from oil to other agricultural products such as cocoa, groundnut, and palm oil to boost its economy (Oyewunmi, 2018).

In addition, there are also allegations of connivance of multinational oil companies with government officials in the sector to truncate efforts of the Federal Government in exterminating gas flaring in the sector in compliance with the International Conventions for Sustainability of the Ecosystem. It is asserted that Nigeria flared about 12.5% of the world's aggregate of gas flared (World Bank, 2006).

However, in Nigeria, a series of dates have been set to end gas flaring without any serious commitment to enforce the same. In 1969, the administration of Yakubu Gowon made effort to combat gas flar-

ing in Nigeria by ordering oil companies to acquire resources and technologies that will facilitate the use of associated gas in 5 years. The petroleum companies botched to acquire such resources that will gather the flared gas. Similarly, in 1983, another deadline was also fixed as zero flare date with stringent penalties for non-compliance and in 1984 the date was also shifted via executive orders. The date was further shifted to January 1, 2008 as a zero tolerance flare period with a serious threat to winding up any oil company that infringed the order; nevertheless, no oil company has been shut down after the end of the deadline without meaningful compliance recorded with the laws prohibiting gas flaring in Nigeria.

Academic researchers have shown that some of the hurdles to the Federal Government's efforts to eliminate gas flaring are lack of finance to install essential modern technologies and infrastructure to prevent gas flaring. Poor enforcement of legal, institutional, regulatory framework for combating gas flaring, and other environmental risks that were aggravated by gas operators' limited access to international and local gas markets for gas exports (Olujobi, 2017).

3 | RESEARCH METHODOLOGY

The objective of this study is to analyze the legal and institutional framework regulating gas flaring in Nigeria and to determine their efficiency in exterminating gas flaring in the upstream petroleum sector and to recommend practical measures for ending gas flaring in Nigeria. To achieve this objective, the researchers explored the library-based doctrinal legal research method, supported by a contextual legal analysis, including reference to Internet sources, an extensive review of academic literature, examination of case studies, and through analysis of relevant judicial and statutory provisions with comparative analysis of the legal framework for combating gas flaring in Nigeria, Canada, United Kingdom, and Saudi Arabia. The study adopts secondary sources, such as journals, textbooks, and primary sources, such as case laws and statutes. It suggests the need to use the lessons learnt from the selected case study countries to reform Nigeria's anti-flaring laws for efficiency in the utilization of gas in the sector.

4 | THEORETICAL FRAMEWORK FOR COMBATING GAS FLARING IN NIGERIA

Sustainable Development Theory of 1980, which emanated from Stockholm Conference on Human Environment in 1972, states that government should use their extractive resources in a sustainable way. However, the Brundtland Report perceives "sustainable" as development that satisfies the current necessities without compromising the ability and the needs of forthcoming generations (Brundtland Report, 1987). It is a development where the utilization of extractive resources, the course of financings, thrust of technological advancement, and institutional legal framework are in conformity with the international best practices to enhance current and future potentials in the mid-stream sector to satisfy mortal needs, with the aim of promoting harmony among human beings and between humanity and nature in general (Olujobi and Olujobi, 2020).

The theory helps the study by emphasizing that the use of natural resources ought not to jeopardize the value of life of present-day and upcoming generations and should not damage the ecosystems (United Nations Development Programme, United Nations Department of Economic and Social Affairs and the World Energy Council, 2000). The theory helps the study by emphasizing that human beings must be cautious of the way they manage natural resources in order to aid sustainable development in the sector through proper management of petroleum resources to combat gas flaring by oil companies.

Another theory that is germane to this research is the resources curse theory, which is traced to 1970–1990, and emphasizes those natural resources abundant countries are largely suffering from poor economic growths. That resources wealthy countries lack economic prosperity and developments that commensurate with their abundant petroleum resources due to prevalent corruption, failure to diversify their economies and natural resources to other natural endowments such as agriculture, solid minerals among others to enhance their industrial developments to combat gas flaring and other environmental

degradations. There is therefore the need for stringent enforcement of anti-flaring and other environmental laws to protect social, economic, and other environment interests in the sector and to improve the welfare of its citizens.

5 | NATIONAL LEGAL REGIME FOR COMBATING GAS FLARING IN NIGERIA

In Nigeria, several legislative efforts have been made to combat gas flaring particularly sections 33(1) and 34(1) of the 1999 Constitution that guarantees right to life and right to dignity of human persons. These rights can only be sustained through clean and healthy environment, but section 3(2)(a)(b) of the Associated Gas Rejection Act which allows gas to be flared with the consent of the Minister of Petroleum is in contravention of the 1999 Constitution that guarantees right to life and right to dignity of human person; therefore, the act became null and void for being inconsistent with the provisions of the Constitution. Furthermore, sections 13 and 20 of Chapter two of the same 1999 Constitution (as amended) fail to make breach of the duty of the Federal Government to protect Nigeria's environment from degradations enforceable. The Constitution fails to provide direct legal remedies for the aggrieved parties on environmental degradations. Also, the Associated Gas Re-injection Act was enacted to prohibit gas flaring on January 1, 1984, the gas flaring ultimatum date was later changed to December 2003, and it was subsequently moved to 2006. It was further shifted from January 2008 to December 2008.

In July 2, 2009, the National Assembly enacted the Gas Flaring (Prohibition and Punishment) Act 2009 with a gas flaring time limit fixed for December 31, 2010. The abandoned Petroleum Industry Bill also set gas flaring deadline for 2012, while the new Petroleum Industry Governance Bill 2017 outlaw gas flaring. The Gas Flaring Prohibition and Punishment Bill 2016 set the ultimatum for gas flaring to December 2016. Several deadlines with meager sanctions were fixed by the Federal Government, which has not deterred gas flaring in Nigeria. It is quite unfortunate that the Gas Flaring Prohibition and Punishment Bill and [Associated Gas Re-Injection \(Amendment\) Bill](#), which could have combated this challenge in Nigeria and minimizing other ecological consequences of gas flaring, are pending at the National Assembly without any urgency of national importance attached to the bill by the National Assembly.

In addition, the Flare Gas (Prevention of Waste and Pollution) Regulations 2018 is to combat greenhouse gas emissions via flaring and venting of natural gas in Nigeria. It adopts the polluter pays principle with carbon tax (Nnona, 2003). It increased the penalty from ₦10 per thousand standard cubic feet for gas flaring especially where the company produced more than 10,000 barrels of crude oil or more to US\$2.0 per thousand standard cubic feet of gas and where the company produced less than 10,000 barrels of crude oil per day US\$0.50 per thousand standard cubic square feet of gas. It sanctioned failure to make available precise flare figures and denial to offer access to flare sites with suspension or termination of the company's operating license. It offers to implement the provisions of the Nigerian

Gas Flare Commercialization Programme (NGFCP) 2018, but it has not combated gas flaring due to poor enforcement and poor monitoring scheme of the regulatory agency saddled with such responsibility under the applicable anti-gas flaring and other environmental laws in the sector (Olujobi, 2017).

In an attempt to combat gas flaring and to transform flared gas to commercial benefits, the Federal Government initiated the NGFCP to transform the midstream sector with penalty of \$2.50 per 28.317 standard cubic meter for gas flared for each day for noncompliance with reporting standard. There is additional punishment of revocation of oil license or lease by the petroleum minister in the case of non-compliance oil company. This will only achieve its objective if implemented stringently and consistently to combat gas flaring in the sector.

It is imperative to note that section 44 (3) of the [1999 Constitution of the Federal Republic of Nigeria](#) (as amended) and section 1(1) of the Petroleum Act 1969 (as amended) confers title to petroleum and other extractive resources on the Federal Government, but this does not impede the right to compensation from damage suffered or that occurred from petroleum exploration activities in the sector such as gas flaring (see the following relevant court cases: [Elf Nigeria Limited v. Opere Sillo and Anor \(1994\) 6 NWLR \[Pt.350\] 258](#); [Shell Petroleum Development Company Ltd v. Councillor F.B. Farah and Others \[1995\] 3 NWLR \[Pt. 382\] 148 at 185](#)).

As part of the efforts of the Federal Government to combat gas flaring, the Department of Petroleum Resources (DPR) is statutorily entrusted to manage the oil sector as well as the Nigerian National Petroleum Corporation (NNPC) through its subsidiary, the Nigeria Gas Company which is assigned to regulate gas transmission and distribution in Nigeria with a monopoly of gas pipelines. This is a concern for potential investors. There is therefore, the need for explicit statutory guidelines on the roles of the agency, and there is the need for adequate gas pipelines for efficient utilization of Nigeria's vast gas resources to boost the Federal Government's foreign exchange earnings from gas and to mitigate other oil and gas business risks in the sector.

In addition to all other efforts in the sector, the Federal Government set April–October 1980 for oil companies operating in Nigeria to remodel gas application projects and to combat gas flaring. Equally, in 1984, a fine was introduced into the Associated Gas Re-Injection (Continued Flaring of Gas) Regulations which gave room for limited indemnities to flare gas in certain circumstances. This was also amended 1985 with a fine of 2 Kobo for non-compliance for each 1,000 standard cubic feet of gas flared. The fine appears too meager, and the Federal Government increased the fine in January, 1998 to US\$11 for every 1,000 standard cubic feet of gas flared by oil operator in the sector.

The Associated Gas Re-Injection (Amendment) Act 2004 was also enacted. It required detailed plans for gas utilization with zero tolerance for gas flaring by oil and gas companies unless exemption is given by the petroleum minister. The sanctions prescribed by the Associated Gas Re-injection Act against petroleum companies for flaring of gas are inadequate, due to fact that the act has not achieved its aim as companies prefer to pay the fine than to commercialize the flared gas due to low gas market in Nigeria. Gas flaring menace has been made worse by the decision of the Tax Appeal Tribunal in the case of *Mobil Produc-*

ing Unlimited v. Federal Inland Revenues Services (2015), where the court held that the prescribed punishments for gas flaring as enshrined in the Associated Gas Reinjection Act are tax deductible. This implies that oil companies can flare gas as much as they desire as much as the prescribed penalties are deducted from their taxable incomes. This verdict appears to have aggravated gas flaring by oil companies in the sector.

Also, the National Policy on the Environment and Nigeria's National Agenda 21, initiated by the Federal Ministry of Environment for proficient directives on air quality, standard and natural gas preservation with the aim of combating gas flaring and other environmental risks in the sector. Also, the Policy for Natural Gas Conservation and Development requires that production sharing contracts executed by oil companies must embrace gas application, clauses to combat gas flaring, guarantee healthy, and sustainable environment. Gas companies are obliged to perform gas field optimization on their gas concessions to prevent gas flaring. Noncompliance with this policy has not attracted any sanction as several oil companies have not performed their gas field optimization, and none have been sanctioned for non-compliance in the sector.

Besides, the Gas Flaring (Prohibition) Bill 2017 is still undergoing legislative scrutiny at the National Assembly without any national importance attached by the legislatures. There is therefore the need for thorough review of the notable gaps in the bill especially the provisions on taxes and other fiscal policies to avoid double taxations and other legislative *lacunas* if it is finally crystallized into law for combating gas flaring. Similarly, the Downstream Gas Act is to combat institutional policies restrictions on investments in the downstream petroleum sector this may impede potential investments in the sector especially where the government appears not to have enough political will to enforce its anti-flaring laws.

The National Environmental Standard Regulation Enforcement Agency (Establishment) Act (NESREA) 2007 expressly annulled the Federal Environmental Protection Agency Act 1988. The aim of NES-REA is to protect and develop Nigerian environment, biodiversity protection, and to ensure sustainability of its extractive resources. Sections 7(g),(h),(j),(k),(i) and 8(g),(k), (l),(m), (n)(s) of the act set up mobile courts for speedy trial of those that violate its provisions but the act expressly prohibits petroleum industry from its operations. The penalties for violation of its provisions are penal in nature without any provisions for civil remedies for victims of environmental infringements; this is another major flaw of the act. It is pertinent to note that oil companies are excluded from environmental audits and from establishing repository for the implementation of mechanisms on environmental standards. The justification for the exclusion of oil and gas companies from the act by the legislature cannot be easily fathomed. The agency's power of investigations of oil pollution is limited to oil spillage as stated under section 8(g) of the act. The exclusion of oil and gas companies' environmental degradation and pollution from the scope of the agency appears to be a serious legislative setback in combating gas flaring in Nigeria's midstream and upstream petroleum sector.

The act combats gas flaring by oil companies being a legal entity and by its employees who are individually prone to incarceration for

a term not more than 10 years, respectively. Section 20(4)(5) of the act allows the minister of petroleum to combat gas flaring and in certain situations the minister may award special license to flare for a short period, and failure to conform to the act attracts punishment not above the sum of ₦500,000,000.00. Section 27(2) of the act prohibits the release of deleterious substances into the air, land, and water in Nigeria with a fine not above ₦100,000 or 1 year incarceration, if committed by a legal entity on conviction a fine not above ₦100,000 and supplementary fine of ₦50,000 for each day that the infringement continues may be imposed by the agency. These penalties appear too meager to combat environmental degradations in the sector. Additional remedy such as restoration should be added to the remedies for environmental degradation to discourage environmental abuses and gas flaring by oil companies.

The Petroleum Drilling and Production Regulation Act 1969 was enacted in conformity with the Petroleum Act to oversee the petroleum exploration and production in Nigeria. The Regulation 42 requires that oil companies are to submit scheme for application of natural and associated gas discovered in the course of oil exploration and for the companies to make use of advanced technologies or equipment for oil exploration activities, but most of the equipment being utilized by these oil companies are obsolete and in bad shape thereby making enforcement of this act impracticable. Another flaw of the act is the failure to define “good oil field practice” or set the yardstick for estimating oil field. The oil companies in Nigeria have not complied with the act, neither the act has been implemented efficiently by the regulatory agencies in the sector to deter gas flaring (Jamilu Ib, 2016).

Also, the *Harmful Waste (Special Criminal Provisions Act Vol. 7, Cap H1, LFN 2004*, section 6 prohibits acquisition, trade deposit, and stowage of toxic waste with penalty of life imprisonment if found culpable of the offence and where the offence was committed by legal entity the officer of the company shall be liable except if the offence was committed with his knowledge. The major weakness of the act is the failure to extend the act to all forms of harmful wastes generated in the sector including gas flaring. Multinational oil and gas companies have not also complied with the above provisions, and it has also not been strictly enforced by the regulatory authorities in the sector due to the absence of stringent sanctions under the regulation for non-compliance with its provisions. The laws appear not to be in conformity with the current legal reality in the gas sector and the anticipated legal challenges in Nigeria. Therefore, there is the need for reform of the act in conformity with the present-day developments in the international midstream sector. The reform must inculcate zero tolerance for gas flaring and all forms of environmental degradations. Environmental protection for sustainability, and there is the need for active corporate social responsibilities by oil and gas companies in the sector to promote sustainable developments in Nigeria.

The Petroleum Industry Governance Bill 2017, which replaced the Petroleum Industry Bill 2012, prohibits gas flaring without approval from the petroleum minister with a penalty not less than the worth of the gas flared by the oil company, but the bill has not been assented by the President to commence operation and to deter gas flaring in the sector.

The Flaring (Prohibition and Punishment) Bill 2010 prescribed stiffer penalty including closing down of oil fields that failed to comply with its provisions. The Environmental Management Bill 2010 made the directors of oil companies liable for gas flaring with 10 years incarceration or fine of N500 million on conviction, but this bill has not been passed into a law.

To combat gas flaring, the Federal Government also endorsed the Paris Climate Change Agreement and signed the Global Gas Flaring Partnership's principles to end global flare in 2030. Similarly, Nigeria is committed to end national gas flaring in 2020. The Federal Government is empowered by virtue of Paragraph 35b of the First Schedule of the Petroleum Act 1969 (as amended) to capture gas at flare. This prompted the introduction of NGFCP (as earlier said) to promote technical and commercial sustainability of gas utilization in Nigeria through third-party investors to combat gas flaring and to enhance market driven by commercial structure which will enable flared gas to be merchantable in Nigeria and in other developed gas markets in Africa.

The various national legal frameworks enacted to combat gas flaring and to promote sustainable development and efficiency in the utilization of gas have not been efficiently implemented, monitored, and evaluated by the various regulatory agencies saddled with the tasks, due to lack of political will and lack of commitment to enforce the extant anti-flaring and environmental laws in the sector to combat continuous flaring of gas by oil companies operating in Nigeria.

6 | STATUTORY INSTITUTIONS REGULATING GAS FLARING IN NIGERIA

The statutory institutions saddled with the responsibility of regulating gas flaring among others are the Ministry of Petroleum Resources and Energy, the ministry is headed by the petroleum minister who is statutory empowered to formulate policies regulating the oil industry via the DPR to enact regulations for oil exploration and production in Nigeria. To reduce gas flaring, DPR must perform efficiently its statutory function of regulating the oil sector devoid of corruption and other unethical practices in the sector. There is the need for the Federal Government to release the ministry budget or allocation on time to motivate them to perform their statutory mandates or oversight functions efficiently in the sector.

Another principal agency regulating the sector is the Nigeria Gas Company; it regulates the midstream sector to commercialize gas through the development of fully integrated gas supply system. It has not live up to expectation by fully optimized economic potentials of Nigerian gas for the economic benefits of Nigerians and potential foreign investors to end gas flaring and other environmental hazards in the sector (Ofuhie, 2006). The NNPC exercises both the fiscal and regulatory functions in the sector; it has 12 subsidiaries, encompassing the whole oil industry operations. The corporation should be allowed to compete commercially with other oil companies in the sector via its upstream petroleum subsidiary the Nigeria Petroleum Development Company. NNPC should be given full autonomy devoid of governmental interference to enhance its full operation capacities like other legal

entities operating in the sector. There is the need to restructure the corporation by separating its commercial roles from its regulatory roles to enhance its efficiency in the sector.

Also, another statutory agency regulating the sector is the Federal Ministry of Environment, which was set up in 1992 to regulate the environment and to prevent environmental hazards in Nigeria especially in the oil and gas sector. There is also the Niger Delta Development Commission, which was created under the Niger-Delta Development Commission Act 2000 due to the Federal Government's desire to end ecological problems in the oil-producing communities and to combat environmental and ecological problems associated with the petroleum sector's operations in the areas as stated under sections 3 and 7 of the act. The major challenge of the agency is mismanagement, corruption, and poor funding due to failure of some oil companies to comply with section 14(3) (b) of the act which requires payment of 3% of the oil companies' budgets to the agency. Also, there is a problem of persistent refusal of the Federal Government to fulfill its legal obligations or commitment of 15% subvention annually to the agency. This has hampered the efficiency of the agency in performing its statutory functions in the sector (Abila & Damfebo, 2006).

The activities of the regulatory authorities in the sector over the years on gas flaring appear to be uncoordinated and not proactive enough to combat the menace in the sector; therefore, there is the need for total overhaul of the legal framework establishing the agencies for efficiencies in the discharge of their statutory responsibilities in the sector against gas flaring and other environmental hazards in the sector.

7 | COMPARATIVE ANALYSIS OF NATIONAL LEGAL FRAMEWORK OF NIGERIA, CANADA, THE UNITED KINGDOM, AND SAUDI ARABIA FOR COMBATING GAS FLARING

The choice of the selected case study countries is based on the transparent and proper management of their gas resources which have eliminated gas flaring and other environmental degradation activities in their oil sectors. In addition, the selected countries being nations like Nigeria with vast oil and gas deposits and being relatively advanced midstream jurisdictions, with stringent anti-gas flaring legal framework, Nigeria can use the lessons from the selected countries to reform its anti-flaring laws and to consider the selected case study countries' legal efforts towards combating gas flaring in the sector (see Exhibit 1).

The right to explore petroleum resources in Nigeria is vested exclusively on of the Federal Government by the section 44 (3) of the 1999 Constitution (as amended) and section 1 of the Petroleum Act 1969 (as amended), but in the United Kingdom the title to oil is conferred on the Crown as specified under the Petroleum Act 1998. The United Kingdom's Government does not take part in petroleum activities but only collects corporate taxes, while in Canada ownership of natural resources is divided between the Federal and the provincial governments, first nations groups (Aboriginal rights), and private freehold ownership to avoid regulatory conflicts in the sector. The Canadian

Energy Strategy was established to promote transparency and efficiency in the administration of their oil sector. Canada is the fourth major exporter of natural gas and 19th major of proven natural gas reserve in the world.

The Energy Utilities Board regulates the petroleum industry in Canada, while in the United Kingdom the Department of Trade and Industry regulates the sector by virtue of the Petroleum Act. Similarly, the Nigeria Gas Company regulates the sector in Nigeria. In the United Kingdom, the Energy Act 1976, the fiat of the Secretary of State for Trade and Industry regulates removal of natural gas by flaring or releasing unignited gas into the atmosphere in the sector.

It is vital to note that gas flaring is strictly regulated in Alberta, Canada; flair license and records of flared and vented gas are carried out by the National Energy Board, a Federal energy regulatory body in Canada. It is established by the National Energy Board Act. In Nigeria, the Nigerian Gas Company under the Ministry of Petroleum Resources regulates gas flaring and grant permits to flare gas. In the United Kingdom, UK's Oil and Gas Authority issues licenses and the Hazardous Installations Directorate regulates gas supply and gas pipelines in the sector. Also, the Alberta Energy Regulator in Canada enforces their laws stringently against gas flaring. Consequently, many oil rigs have been shut down due to gas flaring as many oil companies are going bankrupt. Abandoned oil rigs that are no longer producing crude require hundreds of millions of dollars to remediate the gas flared in the sector while in Nigeria failure to comply with the various environmental laws during decommissioning of oil rigs by oil companies are not sanctioned adequately.

In the United Kingdom, the main legislation regulating oil and gas is the Energy Act 1976 and the Petroleum Act 1998 (as amended). These are the environmental statutes regulating onshore hydrocarbon companies. In Nigeria, the Petroleum Act 1969 (as amended), petroleum regulations enacted according to the act, the Associated Gas Reinjection Act 1979, Associated Gas Re-injection (Continued flaring of Gas) Regulation 1985, Environmental Impact Assessment Guidelines, Effluent Limitation Regulations 1991 among others are the legal framework for regulating the sector.

The United Kingdom's Petroleum Act 1998 requires that each production facility has to preserve gas and to avoid needless depletion of the ozone layer during oil exploration activities. The license to flare gas is for a long term of 3 year and flaring of less than 40 tons per day (Scottish Carbon Capture and Storage, 2014). The Flare Transfer Pilot Trading Scheme is another mechanism put in place to combat gas flaring in the United Kingdom through trading of gas flaring volumes. Oil companies are allowed to sell unused flare gas volumes. This has declined gas flaring to 11% in the United Kingdom (World Bank, 2006).

Similarly, the Federal Government of Nigeria also initiated similar scheme called the Nigerian Gas Flare Commercialisation Programme (NGFCP) to transform flared gas to serious commercial benefits for the nation. Equally, the European Emission Trading Scheme was also introduced to eradicate emissions by the European oil companies through payment for extra CO₂ grants. This has declined gas flaring in the sector. In Nigeria, the Department of Petroleum Resources (DPR) authorized flare of gases that cannot be marketed which are beyond

EXHIBIT 1 Comparative analysis of gas flared in Nigeria, Canada, the United Kingdom and Saudi Arabia with Approved Penalties

Countries	Gas produced	Gas flared	Penalties	Quantity of Gas utilized	Remarks
Nigeria	Two billion standard cubic feet of gas is produced per day.	About 324 billion standard cubic feet of gas is flared (as much as 40% of the natural gas it produced (Nigeria National Petroleum Company, 2018))	A penalty of ₦612.8 per thousand standard cubic feet of gas. A penalty of ₦150,000 or 6 months incarceration or both, for anyone who provided inaccurate flare data (The Flare Gas Prevention of Waste and Pollution Regulations, 2018)	About 22% of the gas produced is used commercially and approximately 12% is re-injected (Nigeria National Petroleum Company, 2018)	Gas sales volume is approximately 350 mmscf per day (mmscf/d)
Canada	In year 2016 the gas production was 431 106 m ³ /d (15.2 bcf/d) (National Energy Board, 2017)	Approximately 3% of the gas produced is flared with permit or license and sanction for infringement	Can\$100,000 per day for infringement by oil companies	Almost 95% of the gas produced is utilized	Gas market is fully liberalized and deregulated and about 95% of its gas is utilized.
United Kingdom	2.735 tcf of gas per day	The offshore installations 3.82 million cubic meters of gas is flared per day. Gas flared is about 3% of oil produced (Department of Business, Energy and Industrial Strategies, 2018)	The penalties are unlimited fines, imprisonment and revocation of operating license	About 95% of the gas produced is utilized annually	The "Polluter pays" principle is strictly applied by the court in all flaring and environmental law provisions infringement cases in the sector
Saudi Arabia	Saudi Arabia gas production has risen by nearly 60% over the decade from 71 to 110 bcm (BP 2018)	Less than 0.6 bcm of gas is flared per year. This is a great reduction in quantity of gas flared	The government enacted a policy that make it mandatory for industrial usage of gas to generate electricity, water, and production of chemicals for export and uniform gas price of US\$0.50 per MMB was introduced	Approximately 50 bcm per year. It is expected to increase over time	Other economic benefits such as extraction of ethane and natural gas liquids from the associated gases were derived from midstream sector to raise revenues for the government which Nigeria can replicate in the sector

The table was prepared by the author but the contents were sourced from other literatures which are properly referenced.

the oil companies' operational obligations, by assigning an Associated Gas Flaring License to combat gas flaring. While in Nigeria, there is the need for environmental impact assessment, which stipulates the procedures that must be followed in the planning process prior to the procurement of oil rigs in Nigeria. Section 62 of the same act provides for a penalty of ₦100,000 for an individual or 5 years' incarceration or ₦50,000 for legal entities but not exceeding ₦100,000.

In the selected countries, gas may be flared for uninterrupted 48 hours but not exceeding 144 hours in a month which may be due to equipment malfunctions. Every longer period of flaring require Minerals Management Service's consent. It may permit oil companies to flare appropriate quantities of gas for 1 year as may be required to set up the equipment that would prevent gas flaring. Oil companies are, however, required to maintain comprehensive flaring data, which are subject to Minerals Management Service regular inspection and other agencies statutorily empowered to do so. Generally, there is a common mode of

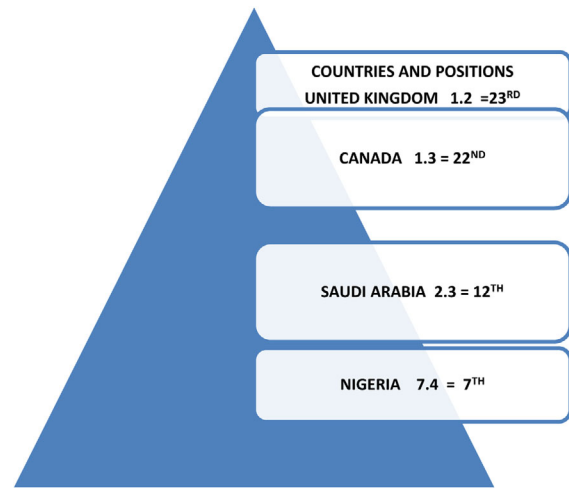
granting permission to flare and vent gas in the selected jurisdictions but the Canadian area of Alberta has utmost inclusive and transparent gas flaring and venting legal regime.

In Nigeria, there is the highest level of natural gas emission for upstream petroleum company's operation which is fixed at 5,000 µg/m³, with a flaring emission limit of 5 mg/m³ hydrocarbons, other operational limitations are comprised in the guidelines. A fee is charged in consonant with the terms of the Associated Gas Reinjection Act. Nigeria imposes the paltry sum of N10 per mcf on gas flared; this could be believed to be encouraging gas flaring instead of discouraging it in the sector. However, a country like Canada (Alberta) should be emulated for putting in place comprehensive and transparent regulatory procedures. The successes achieved by the selected case study countries are attributed to their strong legal, regulatory regime, and strong political will to combat the menace in the sector.

The 2018 World Bank ranking of the selected case study countries among other gas flaring countries in the world

S/N	Countries	Gas flared in 2018 (bcm)	Position
1.	Nigeria	7.4	7th
2.	Saudi Arabia	2.3	12th
3.	Canada	1.3	22nd
4.	United Kingdom	1.2	23rd

Source: World Bank: Gas flaring volumes 2014–2018 (billion cubic meters). Available at <http://pubdocs.worldbank.org/en/603281560185748682/pdf/Gas-flaring-volumes-Top-30-countries-2014-2018.pdf> (accessed September 16, 2019).



Source: This was designed by the authors but the information was sourced from World Bank which was duly referenced in the above table

Selected Dates Previously Fixed to End Gas Flaring in Nigeria by the Federal Government

S/N	Dates	Government/ administration in power	Reasons given for noncompliance by oil companies	Remarks
1.	1969	Yakubu Gowon	Lack of finance to construct a gas re-injection plant (technologies) within the stipulated time	The Federal Government set new deadlines every year due to lack of commitment and political will to enforce its antiflaring laws
2.	1983	Muhammadu Buhari	High cost of re-injecting gas in Nigeria.	Lack of commitment and absence of political will of the Federal Government to enforce its antiflaring laws stringently
3.	1984	Same as above	Due to the flaw in the Act which require license to flare from the minister for a fee	Weak enforcement of Nigeria's antiflaring laws by the regulatory authorities in the sector
4.	2003	Olusegun Obasanjo	The alleged failure of the government to engaged the oil companies before fixing the deadline date	The noncompliance with the deadline exhibits lack of commitment and the absence of the political will of the Federal Government to enforce its antiflaring laws
5.	2004	Same as above	The claim that the deadline date was not expressly spelt out in the legislation or in regulation	Same as above
6.	2008	Umaru Musa Yar'Adua	Same as above	Same as above.
7.	2009	Same as above	Same as above	Same as above
8	2011	Goodluck Jonathan	Lack of finance to install gas infrastructure to end gas flaring	Absence of commitment and political will of the Federal Government to enforce its antiflaring and other environmental laws in the sector
9.	2012	Same as above	Same as above	The excuses given by oil companies are not tenable. The government must wake up to its responsibility of preserving the environment, health and wellbeing of its citizens
10.	2020	Muhammadu Buhari	It is anticipated that they will comply in 2020	Gas flaring will be a thing of the past through stringent enforcement of Nigeria's antiflaring laws and regulations with incentives for gas utilization in the sector through the implementation of Nigeria Gas Flare Commercialization Programme (NGFCP) to monetise flared gas fields. Except where such oil company is issued with a certificate of continue flaring by the petroleum minister in accordance with the provisions of the Associated Gas Re-injection (Continued Gas Flaring) Act

The table was prepared by the author, but the contents were sourced from other literatures which are properly referenced.

Another selected case study country is Saudi Arabia's whose natural gas reserve is about 8.04 trillion cubic meters and 284 tcf. It was ranked sixth among the countries that have natural gas deposits globally after Iran, Russia, Qatar, Turkmenistan, and the United States (BP, 2018). The Saudi Arabia's national oil company Aramco churns out 109.4 bcm of gas. The country is a sovereign and independent nation-state with absolute monarchical system of government unlike Nigeria that operates a Federal system of government, while Canada operates Federal parliamentary system of democracy. The United Kingdom operates a parliamentary system of government. Saudi Arabia is governed by Holy Quran and some other extant laws such as the Kingdom's Basic Law of Governance that govern its energy sector as provided under Articles 14 and 15 of the law. Nigeria and Canada are governed by written constitutions unlike the United Kingdom that is governed by the unwritten constitution.

The Ministry of Petroleum and Mineral Resources regulates the country's oil sector similar to Nigeria. It implements strictly Saudi Aramco Master Gas System, while the Nigerian Gas Company implements Nigeria's Gas Master Plan but inefficiencies and corruption have been an issue in the sector. Aramco ensures the installation of flare gas recovery systems in every oil company facilities with zero gas discharge technologies. Currently, Saudi Arabia does not import or export natural gas with the aim of meeting its domestic gas production and consumption by its citizens.

The fundamental rhetoric question that call for attention is: Why do countries like Canada and the United Kingdom have such low levels of gas flaring while Nigeria has such high ones and why is it that many of the major oil gas companies that operate in Nigeria also operate in other advanced countries but continue to flare in Nigeria but will not dare to do the same in Canada, United Kingdom and Saudi Arabia? The challenge has been poor enforcement of our anti-flaring laws and institutional framework that plays a key role in combating gas flaring in the sector and due to low human capacity, poor funding, and incoherent policy implementation among regulatory agencies among others unlike in Canada, United Kingdom, and Saudi Arabia that operate at an entirely different level of transparency legal regime and stringency to combat gas flaring.

We therefore opined that prescriptive approaches can also be adopted to end gas flaring in Nigeria, where oil and gas companies are obliged to comply with detailed gas flaring and venting regulations enacted by the legislature in conjunction with the regulatory authorities with stringent enforcement procedures and sanctions for non-compliance. Appropriate incentives for compliance with gas flaring legal regime will enhance good governance structures, and it will also combat gas flaring efficiently in the sector.

8 | PRACTICAL SOLUTIONS FOR COMBATING GAS FLARING IN NIGERIA'S OIL SECTOR BASED ON THE LESSONS LEARNT FROM THE SELECTED CASE STUDY COUNTRIES

There is the need for enhancement of gas network equipment to reduce gas flaring in Nigeria's upstream petroleum sector and to

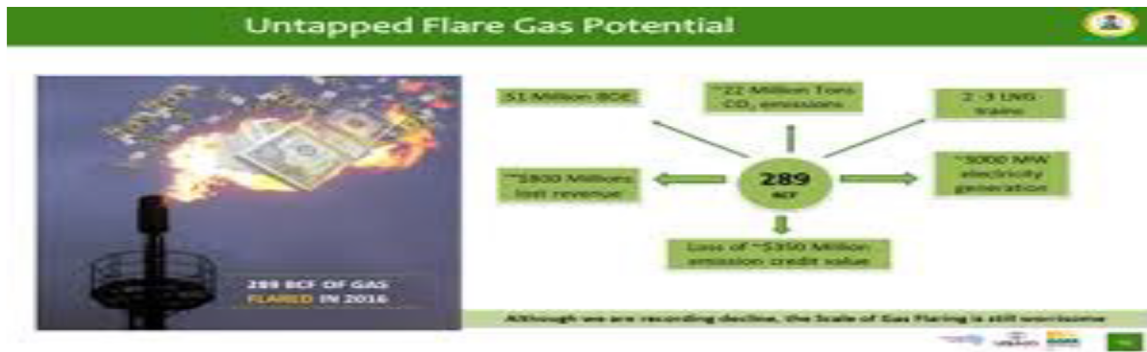
encourage gas export as it is practiced in the United Kingdom, Canada, and Saudi Arabia. There is the need for improvement of gas network infrastructure to improve domestic gas market and to encourage optimal usage of liquefied petroleum gas and to reform the current gas pricing structures to encourage investments in Nigeria like the selected case study countries have done in their gas sectors.

The selected case study countries made it mandatory for big oil companies to make use of gas for production of electricity and for other usage in the sector. Federal Government must encourage domestic usage of cooking gas and other industrial gases in Nigeria. This will encourage commercial utilization of gas, and it will reduce gas flaring. Gas flaring being a global threat; there is the need for robust regulatory and financial incentives for gas utilization. The selected case study countries encourage gas utilization through incentivized legislations.

There is the need for the Federal Government to encourage optimal usage of gas to generate electricity by electricity production or generation companies through legislations with juicy incentives for compliance in the sector. The selected case study countries have mechanisms in place for tracking flared gas by oil and gas companies with consistent flare monitoring and evaluation scheme in place by the agencies. Regulatory authorities must have adequate monitoring and enforcement powers to enforce the provisions of the anti-flaring laws in the sector. This can be replicated in Nigeria to combat gas flaring in the sector. The selected case studies countries stipulate expressly similar Nigeria's circumstances when petroleum companies or gas operators can flare associated gas without prior regulatory authorities' approvals, but this is done with effective gas flaring measurements. To prevent abuse of this procedure in Nigeria, there is need to put in place a control mechanism to benchmark the circumstances when gas operators can flare without prior approval. This must be clearly defined in the law with effective gas flaring measurement such as Fluents' FGM 160 flare gas meter that uses ultrasonic technology for accurate flare of gas measurement with a reporting procedure. This will ensure compliance with the existing anti-flaring legal regime, and it will prevent corruption and others sharp practices in the sector.

The regulatory agencies in the selected case study countries develop clear and efficient operational procedures or processes for combating gas flaring in the sector. There is the need for strict enforcement of Nigeria's gas master plan to entrench zero tolerance of gas flaring in the sector. Transparent gas flaring application and approval procedures must be established in the midstream sector. There are strict anti-flaring legislations in the selected jurisdictions, which empowered their regulatory agencies to combat gas flaring effectively in the sector. The responsibilities of regulatory agencies are clearly defined to avoid overlapping of functions. There are independent from oil and gas operators'. This prevents conflict of interests. Regulatory agencies in Nigeria oil and gas sector must be properly staffed, incentivized, and funded to ensure strict enforcement of the existing antiflaring laws in Nigeria.

The laws regulating petroleum activities and the contractual agreements between the Federal Government and the oil companies should be detailed on the management and elimination of gas flaring. Licenses are to be issued to new oil companies, and license renewals, production sharing arrangements, and joint venture agreements should contain anti-flaring clauses and gas utilization clauses in all the projects.



Sources: Nigerian gas flare commercialization programme, available at: <http://www.ngfcp.gov.ng/about-us/our-mandate/our-strategy/>(accessed September 16, 2019)

This will eliminate gas flaring with stringent penalties such as revocation of oil licenses or leases and payment of pecuniary damages for non-compliance as it is practiced in the selected case study countries to discourage gas flaring.

The legal regimes for combating gas flaring must not be ambiguous; it must entail proactive monitoring, reporting, and enforcement mechanisms. Fixing deadline to end gas flaring must be done *consensus ad idem* by all stakeholders in the sector, for feasible date to exterminate gas flaring with stringent penalties for non-compliance after the agreed dates by all stakeholders in the sector. To combat gas flaring like the selected case study countries, there is the need to benchmark oil production with the capacities for gas utilization by the perspective oil companies operating in Nigeria before the DPR before the issuance of relevant operating oil license(s) by the DPR in order to end gas flaring menace in the sector.

9 | DISCUSSION OF FINDINGS

The writers observe non-existence of gas flare management legal framework and the absence of advanced technologies to capture flared gas for electricity generation and to eliminate gas flaring in the sector. Poor enforcement of anti-flaring laws due to low human capacity and poor funding, there is therefore the need for more private sector participation in gas distribution networks to ensure gas availability, development, increase in gas utilization, and increase its economic storage to reduce gas flaring.

There is also absence of efficient regulatory legal framework with techniques for computing, monitoring, appraising, and enforcing anti-flaring law's provisions with compulsory installation of advanced modern operational equipment for measuring gas flared and for eliminating gas flaring and venting in many developing countries. Oil companies operating in these domain tend to abide by their discretionary operational practices that often contravenes national environmental protection laws and international best practices which have resulted to various environmental risks in the sector.

It is the view of the writers that, for there to be an effective regulation of gas flaring, the acts must be comprehensive and provide for computation and reportage of volumes of gas flared and vented, which

would in turn provide for precise data about gas flaring and venting volumes to the regulatory authorities for combating the menace in the sector. The research found out that flaring rates have declined in the selected case study countries, while in Nigeria, it is still at the highest level despite existence of numerous anti-flaring laws. Strict regulatory measures were put in place in the selected case study countries for oil companies to compulsorily submit their environmental impact assessments on expected emissions and discharges from gas flaring and to state detailed measures put in place for mitigating environmental impacts of their activities in the sector which Nigeria can replicate to combat gas flaring in the sector.

The study is limited by the absence of accurate data on the quantity of gas churned out and the volume of gas flared in the oil fields by oil companies in Nigeria. This would have enhanced insight to the levels of gas flared and vented in the sector and enhanced the panacea for combating gas flaring.

10 | RECOMMENDATIONS

Environmental protection laws must have adequate provisions for combating oil and gas pollution, degradation, and gas flaring. NESREA 2007 should be amended to extend its purview to oil and gas sector pollution and other environmental degradations in the sector to combat gas flaring.

Section 20 of the 1999 Constitution (as amended) on enforcement of environmental objective should be overhauled and moved to the Fundamental Human Rights in chapter 4 of the 1999 Constitution, thereby making it justiciable. It will thus protect and guarantee healthy and sustainable environment. The right to healthy environment will deter gas flaring by oil companies through payment of pecuniary damages to the Federal Government and the victims of their environmental degradations, thereby promoting stringent compliance with the anti-flaring policies and other enabling environment laws in the sector.

Enactment of detailed, fiscal, legal, and regulatory framework governing gas utilization and development will unbundle the gas pipelines networks with effective gas distribution to all zones in Nigeria. There is also the need for a review of regulatory framework with satisfactory operational mechanism to ensure proper implementation of

anti-flaring and other environmental laws and regulatory policies in the sector. Nigeria is referred to as gas province because of the tremendous economic benefits the sector will offer the nation if gas flaring is combated. It will enhance gas distribution networks in Nigeria.

Oil companies are to update their drilling tools in conformity with international standards to end gas flaring through utilization of modern technologies; this is to guarantee environmental protection and natural resources management. Regulatory policies should be transparent with incentives for gas development (Oyewunmi and Olujobi, 2016). Again, there is the need for oil companies to implement the environmental management system that will determine possible environmental impacts of its activities and to put in place appropriate measures to combat gas flaring.

The Federal Government should increase electricity generation in Nigeria through the use of gas to earn more revenues for the Federal Government through local utilization and export of gas. Installation of gas flare meters electronically with data and gas recovery mechanisms, independent reportage, and scrutiny by the Nigerian Gas Company are essential in the sector. Stringent financial sanctions for non-compliance with Nigeria's anti-flaring laws will combat gas flaring. Regulatory bodies saddled with the tasks of regulating the midstream sector in Nigeria should be overhauled due to its poor enforcement mechanisms of the existing anti-flaring laws.

The requirement under the Nigeria Gas Flare Commercialization Programme (NGFCP) that investors or licensees are to execute, deliver, or pay the oil company for the agreements to flare the gas is bound to give room for the large-scale utilization of gas and it will be legally responsible to reimburse the gas investor if the agreed quantity of gas is not produced. However, petroleum companies may not be eager to accept such commitment due to the fact that flared gas is based on the production of crude oil, which is also based on their upstream petroleum activities and economic assessments of their operations by their managements. Any legal framework that requires oil companies to provide certain magnitude of flared gas especially at a time when the demands and production of crude oil has dropped globally may be favorable but it might dampen investments in the gas sector (Yemi Oke, 2012).

The standard Production Sharing Contracts clause 3.3 made provision for reward for obtaining finances at interest and assuming operational risks such as exploration, production risks by petroleum companies which are commercial concerns in the growth of petroleum and gas markets. This may hinder the Federal Government powers to issue permit to petroleum financiers to capture flare gas from oil field which was exploited under a production sharing contract except such petroleum companies offer to share in the incomes accruing to the Federal Government from the contract.

There is the need for more gas pipeline networks to be created to enhance domestic usage of gas and to reduce its flaring. Gas prices should be reasonable and competitive with other forms of energy which are dictated by the market forces. This will encourage investors to invest in the sector and to deter waste of gas resources and to decline environmental risks. There is the need for explicit master plan for the construction, networking of a national gas transmission, and dis-

tribution networks since this is *sine qua non* for national development and sustainability of gas resources in the sector.

11 | CONCLUSION AND POLICY IMPLICATIONS

The research has examined the various approaches adopted by the selected case study countries and lessons Nigeria can learn from the selected case study countries in combating gas flaring. The research has also evaluated several efforts made by the Federal Government of Nigeria to combat gas flaring in 2020. The flaws of the various laws examined were brought to the fore. Suggestions were made, where suitable, in addressing the flaws. Regulatory authorities are to come up with practical and reasonable ways of monitoring compliance in relations to the volume of gas flared or vented, vis-à-vis the permissible levels of gas utilization. Strict implementation, monitoring and enforcement of the NGFCP will save for the Federal Government the huge revenues lost to gas flaring, which could have been utilized for infrastructure development and to enhance power supply in the country. Strict implementation of environmental protection laws will enhance ecological development and financial viability of oil-producing communities in Nigeria, and it will combat unfriendly practices in the sector through stringent implementation of strategic environmental protection measures to combat gas flaring in the sector.

There is the need for national gas transmission grid for easy access to gas by potential users in Nigeria to enhance gas utilization and development through private sector participation projects with detailed and practicable gas policy for the nation to encourage gas investors and to end overreliance on impromptu policy statements by public officials as governing policies in the sector.

To make the regulation efficient, the regulatory authorities must enforce antiflaring laws without fear or favor to ensure total compliance with the antiflaring and other environmental laws to combat gas flaring in Nigeria's midstream sector. Optimal development of gas reserves with more advanced technologies will add enormous economic benefits to Nigeria and Africa continent if properly executed by the regulatory authorities saddled with the responsibility of enforcing the laws for combating gas flaring and other environmental degradations in the sector.

ACKNOWLEDGMENT

The financial support by Covenant University, Ota, Ogun State, Nigeria is gratefully acknowledged.

CONFLICT OF INTEREST

The authors declare no conflict of interest whatsoever.

REFERENCES

- Agboola O. M., Nnamdi, I. N., Egelioglu, F., & Agboola, O. P. et al. (2011). Gas Flaring in Nigeria: Opportunity for Household Cooking Utilization. *International Journal of Thermal and Environmental Engineering*, 2(2), 73. Retrieved from [file:///C:/Users/HP/Downloads/Gas_Flaring_in_Nigeria_Opportunity_for_Household_C%20\(1\).pdf](file:///C:/Users/HP/Downloads/Gas_Flaring_in_Nigeria_Opportunity_for_Household_C%20(1).pdf)

- Atsegbua, L. A., Akpotaire, V., Dimowo, F., Akpotaire, V., & Dimowo, F. (2004). *Environmental law in Nigeria, theory and practice*, Lagos, Nigeria: Ababa Press. Retrieved from <https://www.worldcat.org/title/environmental-law-in-nigeria-theory-and-practice/oclc/57653539>
- BP. (2018). *Statistical review of world energy 2018*. London: BP.
- Brundtland Report. (1987). Retrieved from <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>. Accessed June 23, 2020.
- Jamilu Ibn, M. (2016). Comparing Nigeria's legal framework for combating gas flaring with that of Norway – Lessons for Nigeria. *Imperial Journal of Interdisciplinary Research* 2(9), 1253.
- Malumfashi, G. I. (2007). Phase-out of gas flaring in Nigeria by 2008: The prospects of a multi-win project review of the regulatory, environmental and socio-economic issues. *Nigeria Gas Flaring Petroleum Training Journal*, 4(2), 1–39.
- Nnona, G. (2003). New policy regime for gas in Nigeria a perspective on tax and related incentives. *Journal of Energy and Natural Resources Law*, 21(3), 285–302
- Obayomi, A. (2009). *International Environmental Legal Regimes on Gas Flaring. LLM Seminar paper*. Lagos, Nigeria: Energy Resources Class, Jurisprudence and International Law Department, University of Lagos.
- Ojide, M.G., Salami, D.K., Fatimah, K., Gazi, M. A., & Oke, D. M. (2012). Impact of gas industry on sustainable economy in Nigeria: Further estimations through Eview. *Journal of Applied Sciences*, 12(21), 2244–2251.
- Okafor, J. C. (2016). Nigeria and World Bank Global Gas Flaring Reduction partnership: The tragedy of the commons developing country studies. *Developing Country Studies*, 6(12), 1–30. <file:///C:/Users/HP/Downloads/ToochiGGFRTragedyoftheCommonsPDF.pdf>.
- Oke, Y. (2012). Beyond power sector reforms: The need for decentralized energy options (DEOPs) for electricity governance in Nigeria. *Nigerian Journal of Contemporary Law, UNILAG*, 18(1), 67.
- Okorie, A. (2018). The dominance of foreign capital and its impact on indigenous technology development in the production of liquefied natural gas in Nigeria. *Review of African Political Economy*, 45, 478–490.
- Olujobi, O. J. (2017). Legal framework for combating corruption in Nigeria—The upstream petroleum sector in perspective. *Journal of Advanced Research in Law and Economics*, 8(3), 956–970.
- Olujobi, O. J., Oyewunmi, O. A., & Oyewunmi, A. E. (2018). Oil spillage in Nigeria's upstream petroleum sector: Beyond the legal frameworks. *International Journal of Energy Economics and Policy*, 8(1), 220.
- Olujobi, O. J., & Oyewunmi, O. A. (2017). Annulment of oil licences in Nigeria's upstream petroleum sector: A legal critique of the costs and benefits. *International Journal of Energy Economics and Policy*, 7(3), 364.
- Olujobi, O. J., & Olujobi, O. M. (2020). Theories of Corruption “Public Choice-Extractive Theory” as Alternative for Combating Corruption. *International Journal of Environmental Sustainability and Green Technologies (IJESGT)*, 11(2), Retrieved from <https://www.igi-global.com/submission/proofing/document/?did=49496>.
- Olujobi, O. J., Olujobi, O. M., & Ufua, D. E. (2020). A Critical Appraisal of Legal Framework on Deregulation of the Downstream Sector of the Nigerian Petroleum Industry. *International Journal of Management*, 11(6), 252–268. Retrieved from <http://www.iaeme.com/IJM/issues.asp?JType=IJM&VType=11&IType=6>.
- Omorogbe, Y. (2001). *Oil and gas law in Nigeria*. Lagos, Nigeria: Malthouse Press Ltd.
- Otitolaju, A. (2010). Effects of gas flaring on blood parameters and respiratory system of Oyewunmi and Olujobi (2015) transparency in Nigeria's oil and gas industry: Is policy re-engineering the way out? *International Journal of Energy Economics and Policy*, 5(4), 631.
- Otitolaju, D.-P. (2010). Effects of Gas Flaring on Blood Parameters and Respiratory System of Laboratory Mice, *Mus Musculus*. *The Environmentalist*, 30(4), 340–346.
- Oyewunmi, O. A. (2018). Oil price fluctuations and dependency malaise: What will engender socio-economic adjustments? *International Journal of Energy Economics and Policy*, 8(6), 167–173.
- Oyewunmi, O. A., & and. Oyewunmi, A. E. (2016). Managing gas flaring and allied issues in the oil and gas industry: reflections on Nigeria. *Mediterranean Journal of Social Sciences*, 7(6), 643–649.
- Oyewunmi, O. A., & Olujobi, O. J. (2016). Transparency in Nigeria's Oil and Gas Industry: Is Policy Re-engineering the Way Out? *International Journal of Energy Economics and Policy*, 6(3), 630–636. Retrieved from <https://www.econjournals.com>.
- Scottish Carbon Capture and Storage. 2014. Retrieved from <https://www.sepa.org.uk/regulations/climate-change/carbon-capture-and-storage/>. Accessed April 2, 2020.

TEXT BOOKS

- Abila, S.E., & Damfebo, K.D. (2009). Sustainable development issues in the Niger delta (pp. 268). In F. Emiri & G. Deinduumom (Eds.), *Law and petroleum industry in Nigeria current challenges essay in honour of Justice Kate Abiri*. Lagos, Benin, Ibadan : Malthouse Press Limited, 2009: Malthouse Law Books. <http://invenio.unidep.org/invenio/record/19761>.
- Amokaye, O. G. (2004). *Environmental law and practice in Nigeria* (pp. 6). Lagos, Nigeria: University of Lagos Press.
- Damfebo, K.D., & Sylvanus, E.A. (2009). A critical examination of the National Environmental Standards and Regulations Enforcement Agency establishment Act, 2007. In F. Emiri & G. Deinduumom (Eds.), *Law and petroleum industry in Nigeria current challenges essay in honour of Justice Kate Abiri* (p. 2). Lagos, Nigeria: Malthouse Law Books.
- Ofuhie, M. (2006). Investment Potentials in the Nigerian Gas Sub-Sector In *Oil and gas financing in Nigeria issues, Challenges and Prospects* (p. 120). Lagos, Nigeria: The Chartered Institute of Bankers of Nigeria.
- Orlando, O. (2006). *Construction and Networking of Gas Distribution Infrastructure*. In Oil and gas financing in Nigeria issues, challenges and prospects (p. 243). Lagos, Nigeria: The Chartered Institute of Bankers of Nigeria.

CASES

1. Elf Nigeria Limited v. Opere Sillo and Anor (1994) 6 NWLR [Pt.350] 258.
2. Mobil Producing Unlimited v. Federal Inland Revenue Services (2015) TAT/LZ/033/2013.
3. Shell Petroleum Development Company Ltd v. Councillor F.B. Farah and Others [1995]3 N.W.L.R (Pt. 382) 148 at 185.

STATUTES

1. Associated Gas Re-Injection Act, Cap 26, Laws of the Federation (LFN), 1990.
2. Environmental Guidelines and Standards for the Petroleum Industry in Nigeria 2002.
3. Nigeria LNG (Fiscal Incentives Guarantees and Assurance) Act, No. 39, 1990.
4. Petroleum (Drilling and Production) Regulations, 1969.
5. Petroleum Act, 1998.

INTERNET SOURCES

- Abisoeye, K. (2017). *DPR engagement with companies on data requirements for the Nigerian gas flare commercialization programme (NGFCP)*. Retrieved from <https://www.dpr.gov.ng/dpr-engagement-with-companies-on-data-requirements-for-the-nigerian-gas-flare-commercialization-programme-ngfcp/>
- Abuhesa, M. B. (2010). *Investigation into gas flaring reduction in the oil and gas* (Ph.D. thesis). Salford University. Retrieved from <http://usir.salford.ac.uk/30794/1/PhD10.pdf>
- Amaza, I. (2018). *Nigeria: The Nigerian gas flare commercialization programme: A Win-win situation?* Retrieved from <http://www.mondaq.com/Nigeria/x/689396/Oil+Gas+Electricity/The+Nigerian+Gas+Flare+Commercialization+Programme+A+WinWin+Situation>.

- Department of Business, Energy and Industrial Strategies (2018). *Digest of United Kingdom energy statistics 2018*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/728438/dukes_tt.pdf
- Dodondawa, O. (2018). NGFCP: *The government intervention that may end routine gas flaring by 2020*. Retrieved from <https://www.tribuneonline.ng.com/157616/>.
- Foreign Affairs, Trade and Development Canada, (2015). *Invest in Canada*. Retrieved from https://www.international.gc.ca/investorsinvestisseurs/assets/pdfs/download/Oil_and_Gas.pdf
- Isaya, A., (2018) *The Nigerian gas flare commercialization programme: A win-win*. Retrieved from <https://www.mondaq.com/nigeria/oil-gas-electricity/689396/the-nigerian-gas-flare-commercialization-programme-a-win-win-situation>. Accessed June 24, 2020.
- Jamie Stewart, R. (2014). *A review of flaring and venting at UK offshore oil fields: An analogue for offshore carbon dioxide enhanced oil recovery projects?* Retrieved from <http://www.sccs.org.uk/images/expertise/reports/co2-eor-jip/sccs-co2-eor-jip-wp11-flaring-Venting.pdf>.
- Kachikwu, I. (2018). *What gas flaring prohibition bill will achieve*. Retrieved from <https://punchng.com/gas-flaring-prohibition-bill-will-achieve/>
- Manning and Tamura-O' Connor, B. (2018). *Oil and gas regulation in Canada: Overview*. Retrieved from [https://uk.practicallaw.thomsonreuters.com/3-6331728?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&comp=pluk&bhpc=1](https://uk.practicallaw.thomsonreuters.com/3-6331728?transitionType=Default&contextData=(sc.Default)&firstPage=true&comp=pluk&bhpc=1)
- National Energy Board. (2017). *Canada's energy future 2017 supplement: Natural gas production*. Retrieved from <https://www.neb-one.gc.ca/nrg/ntgrtd/fttr/2017ntrlgs/index-eng.html?=-undefined&wbdisable=true>.
- NNPC (2017). *NNPC: Nigeria drops to seventh highest gas flaring country*. Retrieved from <https://www.thisdaylive.com/index.php/2017/04/03/nnpc-nigeria-drops-to-seventh-highest-gas-flaring-country/>.
- Ojijagwo, E. N. (2017). *Development of a sustainable framework to manage flare gas in an oil and gas environment: A case study of Nigeria*. Retrieved from <https://wlv.openrepository.com/bitstream/handle/2436/620607/ojijagwo%20%20phd%20thesis.pdf?sequence=1&isallowed=y>.
- Situation? Mondaq Business Briefing (2018). Issue. Retrieved from <http://www.aelex.com/wp-content/uploads/2018/03/the-nigerian-gas-flare-commercialization-programme.pdf>.
- Ugochukwu, C. N. C. (2008). *Sustainable environmental management in the Niger delta region of Nigeria: Effects of hydrocarbon pollution on local economy* (Doctoral thesis). Retrieved from https://opus4.kobv.de/opus4-btu/files/438/Collins_Ugochukwu_PhD_Dissertation.pdf
- United Nations Development Programme, United Nations Department of Economic and Social Affairs and the World Energy Council. (2000). *World energy assessment: Energy and the challenge of sustainability*. Retrieved from <https://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Sustainable%20Energy/wea%202000/Overview.pdf>
- World Bank, (2006). *UK flaring policy*. Retrieved from http://siteresources.worldbank.org/extggr/resources/5780681258067586081/uk_flarigpolicy.pdf
- Nigeria National Petroleum Company, (2018). *Development of Nigeria's oil industry*. Retrieved from <http://nnpcgroup.com/NNPCBusiness/BusinessInformation/OilGasInNigeria/DevelopmentoftheIndustry.asp>
- Krane, J. (2019). *Energy governance in Saudi Arabia: An assessment of the kingdom's resources, policies, and climate approach*. Retrieved from <https://www.bakerinstitute.org/media/files/research-document/09666564/ces-pub-saudienergy-011819.pdf>
- Fluenta. (2019). *Reducing flaring in Nigeria: Presidential approval*. Retrieved from <https://www.fluenta.com/reducing-flaring-in-nigeria-presidential-approval/>.

REPORT

Nigeria National Petroleum Corporation Monthly Financial and Operations Report. (November 2017).

STATUTES

- Associated Gas Re-Injection (Amendment) Bill.
- Constitution of the Federal Republic of Nigeria 1999 (as amended).
- Flare Gas Prevention of Waste and Pollution Regulations 2018.
- Harmful Waste (Special Criminal Provisions Act Vol. 7, CapH1, LFN 2004.
- National Environmental Standard Regulation Enforcement Agency (Establishment) Act (NESREA) 2007.
- Petroleum (Drilling and Production) Regulations of 1969.
- Petroleum Act, Cap P10, Laws of the Federation of Nigeria (LFN) 2004.
- The African Charter on Human and Peoples Right to Healthy Environment.
- The Associated Gas Re-Injection (Amendment) Act 2004
- The Gas Flaring (Prohibition) Bill 2017.
- The Gas Flaring Prohibition and Punishment Bill.
- The Harmful Waste (Special Criminal Provisions Act Vol. 7, Cap H1, LFN 2004.
- The Petroleum Drilling and Production Regulation Act LFN 2004.
- The Petroleum Industry Governance Bill 2017.
- The United Nations Conference on Human Environment Stockholm, 16 June, 1972.
- The United Nations Framework on Climate Change - Kyoto Protocol.

How to cite this article: Olujobi OJ, Olusola-Olujobi T. Comparative appraisals of legal and institutional framework governing gas flaring in Nigeria's upstream petroleum sector: How satisfactory?. *Environ Qual Manage*. 2020;1-14. <https://doi.org/10.1002/tqem.21680>