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GAS FLARING IN NIGERIA: PROBLEMS AND PROSPECTS

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ABSTRACT: *The issue of gas flaring in Nigeria has become a topical one in view of the devastating effect gas flaring has in the socio-economic lives of the people in the affected areas. Historically, it is said that gas flaring is as old as oil production in Nigeria. Oil exploratory activities of oil companies in Nigeria have caused gas flaring resulting in loss of lives and properties in the affected communities where gas is flared. There is no specific legal framework that prohibits gas flaring in Nigeria inspite of the environmental problems associated with it. The existing law that appears to regulate gas flaring in Nigeria is not effective as it does not completely prohibit gas flaring but only provide monetary penalties for continued flaring of gas by oil companies in Nigeria. The Judiciary therefore appeared to have championed the cause for the abolition of gas flaring in Nigeria. This paper examines the legal framework for gas flaring in Nigeria and further identifies the problems and prospects associated with the flaring of gas in Nigeria and makes useful recommendations.*

KEYWORDS: Gas flaring, Problems, Prospects, Nigeria

INTRODUCTION

In Nigeria, the oil and gas sector accounts for about 35 per cent of Gross Domestic Product (GDP), and petroleum exports revenue represents over 90 per cent of total exports revenue. Apart from petroleum, Nigeria's other natural resources include natural gas, tin, iron ore, coal, limestone, niobium, lead, zinc and arable land.[1]Nigeria has one of the ten largest natural gas reserves in the world and roughly 50% of the deposits are discovered in association with oil. It possesses the largest deposits of natural gas in Africa, most of which are located in and around the Niger Delta region.[2]Natural gas supply in Nigeria comes in two streams - gas in isolated wells (or non-associated gas), and gas discovered together with oil (associated gas). These two sources exist in roughly equal proportions. While non-associated gas can be left underground until needed, associated gas is unavoidably lifted together with crude oil, and must either be harvested or disposed on-site as an unwanted by-product

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[1] Organization of the Petroleum Exporting Countries (OPEC) website, available at http://www.opec.org/opec_web/en/about us/167.htm, accessed 21 May, 2016
[2]Aigbedion, I. and Iyayi, S. 'Diversifying Nigeria's Petroleum Industry', (2007)2(10), *International Journal of Physical Science*, p. 266

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of oil. The common on-site disposal methods are by venting, if the volume is small enough, or flaring for larger volumes.[3]

For many years after the discovery of oil in commercial quantities in Nigeria, most of the associated gas is flared, with its attendant environmental consequences on the health of the people. Nigeria flares 17.2 billion m^3 of natural gas per year in conjunction with the exploration of crude oil in the Niger Delta. This high level of gas flaring is equal to approximately one quarter of the current power consumption of the African continent.[4]It has been stated that more than 400 million tones of carbon dioxide are injected into the world's atmosphere yearly from gas flares in Nigeria.[5] Nigeria is struggling to overcome its severe electricity generation and distribution deficiencies, yet the country does not have a functional climate or energy policy that aspires towards generating a significant percentage of its electricity from renewable energy sources[6]However, several efforts have been made recently to curtail gas flaring, including the establishment of a liquified natural gas plant, a pipeline to transport gas to some neighbouring countries, and legislative measures to regulate the oil and gas industry.[7]This Paper will examine those legislative measures put in place to curtail the harmful environmental consequences of gas flaring. It will also consider the environmental, health, and social problems associated with the flaring of gas in Nigeria and make recommendations to ameliorate the effects of gas flaring in the region.

History of Gas Flaring in Nigeria

In Nigeria, Oil and Gas Law has a long and rich history dating back to the earliest part of Nigeria's colonial experience with the British.[8] Precisely, exploration of oil and gas in Nigeria began in 1908 with the very first discovery made in the Niger Delta Region in 1956.[9] The discovery was made by Shell British Petroleum (now Royal Dutch Shell) at Oloibiri village in present day Bayelsa State located in the Niger Delta. Ever since this discovery, oil has been found and explored by many foreign oil companies like Chevron, ExxonMobil, Shell Petroleum Development Corporation (SPDC), Total, Eniagip, Addax Petroleum, Conoco Phillips, Petrobras, Statoil hydro and others in the Niger Delta Region of Nigeria.[10]

[3]Ibitoye, F. I., 'Ending Natural Gas Flaring in Nigeria's Oil Fields', (2014)7(3),*Journal of Sustainable Development*, p. 13

[4] Ajugwo, A. O., 'Negative Effects of Gas Flaring: The Nigerian Experience', (2013)1(1), *Journal of Environmental Pollution and Human Health*, p.6

[5] Nigeria: learning clean Development Mechanism (CDM) Lessons "Environmental Rights Action/Friends of the Earth Nigeria and oil watch, Africa, September, 2012. P.2

[6] *Ibid*

[7] Ibitoye, n 3

[8]Mesele, O., 'Fundamentals of Nigerian Oil and Gas Law', available at http://highersolutionslp.com/docs/Fundamentals%20of%20Nigerian%20Oil%20and%20Gas%20Law.pdf accessed 20May 2016

[9]Olaniwun Ajayi, *Nigeria* (Freshfields Bruckhaus Deringer LLP 2013) http://www.freshfields.com/uploadedFiles/SiteWide/News_Room/Insight/Africa_ENR/Nigeria/Nigeria%20oil%20and%20gas.pdf accessed 22 January 2016

[10]Kadafa, A.,'Oil Exploration and Spillage in the Niger Delta of Nigeria', (2012) 2 (3),*Civil and Environmental Research*,,p. 46

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Natural gas emerged in Nigeria as a key energy resource during exploration for crude oil.[11]Gas reserves in Nigeria grew as the government gave incentives to increase the nation's oil reserve base. The development of natural gas started in 1963 with the sale of gas to industries around the gas fields in Ughelli and Aba. The volume of gas produced in excess of industry requirement were consequently flared.[12] Ever since, many oil companies operating in the region have continued to flare large volumes of gas. In 1975, the Nigerian Agip Oil Company (NAOF), a subsidiary of Eni Exploration and Production established its oil and Gas processing plant in Okpai-kwale. In 1987, the company established its Oil and Gas processing plant in Okpau-Kwale. In 1987 the company established a gas recovery and utilization project in response to the governments Gas Re-injection Act[13]. By 2002, the Italian oil company, Agip, had flared gas for about 30 years in the small fishing village of Akaraolu in the Niger Delta region.[14]

According to available evidence most of the flare sites are located within human settlement areas. Most of the flare sites are found in the Niger Delta region. For instance Rumola a community in Port-Harcourt, Rivers State, Shell Company flares gas in the area and is about 300 meters from the nearest dwelling house.[15]

In petroleum-producing areas where insufficient investment is made in infrastructure to utilise natural gas, flaring is employed to dispose of the associated gas. Waste gases are subjected to such a process either because the gases are waste or it is difficult to store and transport them. Non-waste gases are burnt off to protect the processing equipment when unexpected high pressure develops within them. Gas flaring in oil rigs and wells contribute significantly to greenhouse gases in our atmosphere.[16]

Legal Framework for Gas Flaring

The Petroleum Act 1969 remains the primary law regulating oil and gas exploration activities in Nigeria. The Petroleum (Drilling and Production) Act 1979, made pursuant to the Petroleum Act, provides that the licensee or lessee of an Oil Mining Licence (OML) shall, not later than five years after the commencement of production, submit to the Minister of Petroleum Resources, a feasibility study, programme or proposals that it may have for the utilisation of any natural gas that has been discovered in the relevant area.[17] Unfortunately, the provision of the law which required oil companies to submit their strategies for gas utilisation was not seen to be mandatory and no penalty was provided for defaulters. Again, oil companies were given permission to flare gas for a period of five years before submitting the feasibility report.[18] Because of this lacunae, a concrete step to regulate

[11] Osezua, M., *Changing Structure of Natural Gas Developed in West Africa*, (2002), Proceedings of the International Energy Forum on 'Changing Structure of Gas Development and Market in the West African Sub-Region' pp. 123-127
[12] Aigbedion & Iyayi, n 2
[13] Nigeria: "Learning clean Development Mechanism (CDM) Lessons" (n.5) P.3
[14] U. Udok, 'Environmental Degradation in the Niger Delta: A Critique of Existing Laws for Curbing the Degradation' in C. Omaka (ed), *Nigerian Environmental Law Review* (Kingdom Age Publication, Uganda) 68
[15] K. Ebeku, Oil and the Niger Delta people in International Law: Resource Rights, Environmental and Equity Issues (Rudiger Koppe Verlag, Koln 2006) p.146
[16] Ayoola, T. J., 'Gas flaring and its Implication for Environmental Accounting in Nigeria', (2011) 4(5), J*ournal of Sustainable Development*, pp. 244-250
[17] Otiotio, D., *Gas Flaring Regulation in the Oil and Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations* (University of Tulsa College of Law, Oklahoma 2013), p. 25
[18]*Ibid*

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gas flaring in Nigeria was reached in 1979 with the enactment of the Associated Gas Re-Injection Act.

Associated Gas Re-Injection Act

The Associated Gas Re-injection Act 1979 (as amended) became the first anti-gas flaring regulatory framework in Nigeria.[19] The primary intent and purpose of the Act was to phase out gas flaring in Nigeria. The Associated Gas Re-injection Act 1979 (as amended) was the statutory response to the environmental impacts of gas flare. In its recital, it is stated to be an Act to compel every company producing oil and gas in Nigeria to submit preliminary programme for gas re-injections and detail plans for implementation of gas re-injection [20] Section 1 of the Act states thus; 'Notwithstanding the provisions of Regulation 42 of the Petroleum (Drilling and Production) Regulations made under the Petroleum Act,[21] every company producing oil and gas in Nigeria, shall not later than 1 April, 1980 submit to the Minister a preliminary programme for(a) schemes for the viable utilisation of all associated gas produced from a field or groups of fields;(b) project or projects to re-inject all gas produced in association with oil but not utilised in an industrial project'. The Act placed a duty on oil companies to submit detailed programmes and plans for implementation of gas re-injection not later than 1 October, 1980.[22]

Section 3 of the Act is very important as it appears to outlaw gas flaring in Nigeria. It states as follows:

1. Subject to subsection (2) of this section, no company engaged in the production of oil or gas shall after 1st January, 1984 flare gas produced in association with oil without the permission of in writing of the minister.
2. Where the minister is satisfied after 1st January, 1984 that utilization or re-injection of the produced gas is not appropriate or feasible in a particular field or fields, he may issue a certificate in that respect in the production of oil or gas

a. Specifying such terms and condition, as he may at his discretion choose to impose, for the continued flaring of gas in the particular field or fields.

b. Permitting the company to continue to flare gas in the particular field or fields if the company pays such sum as the minister may from time to time prescribe for every 28.317 standard cubic metres (SCM) of gas flared

Under the same Act, no company engaged in the production of oil or gas shall, after 1 January, 1984, flare gas produced in association with oil without the permission in writing of the Minister.[23] The Minister is vested with the power to issue certificates to an oil company to continue to flare gas if such a company pays the sum prescribed by the Minister.[24]Invariably, the law has always provided

[19] Cap 26 Laws of the Federation of Nigeria 2010

[20] Ebeku (n.5) P. 204

[21] This Section which deals with the utilisation of natural gas states that; 'Not later than five years after the commencement of the production from the relevant area, the Licensee or Lessee shall submit to the Minister any feasibility study, programme or proposals that he may have for the utilisation of any natural gas, whether associated with oil or not, which has been discovered in the relevant area'.

[22] Section 2(1)

[23] Section 3 (1)

[24] K. Ekwere, *Sustainable Development of Oil and Gas in the Niger Delta: Legal and Political Issues*. (2009) A Dissertation submitted to The Law of the Sea and Maritime Law Institute, University of Hamburg in partial fulfilment of the requirement for the Degree of Philosophy in Law, pp. 90-91

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for application for permits to be granted by the Minister provided the applicant pays the amount prescribed by the Minister, without providing for strict measures to ensure its effectiveness.[25]
The Associated Gas Re-Injection Act has been criticised for not paying attention to very salient issues on gas re-injection. Apart from making provision for a feasibility report by oil companies interested in natural gas production, the Act made no mention anywhere about related penalties for gas flaring. Indirectly, it may not be out of place to conclude that the law does not make gas flaring illegal. This position in itself has been identified as one of the major weaknesses of the said Act.

As noted by Oluduro and Oluduro, close to the end of 1984, evidence reveals that no oil company had complied with the provisions of the Associated Gas Re-Injection Act and no evidence indicated that the Minister had insisted that the oil companies complied with it.[26] The reason has been presumably attributed to 'adverse effects it could have on the nation's economy if its enforcement results in a halt to oil production operations. It has further been argued that the situation can be linked to national economic interest because if the gas flares are taken away the life wire of the nation's economy is extinguished and the nation cannot afford it.[27] Rather than ensure the enforcement of the law, the Minister made the Associated Gas Re-Injection (Continued Flaring of Gas) Regulations 1984 which provides for exemptions to the earlier general ban on flaring.[28] Unfortunately, the monetary penalty for continued flaring of gas by oil companies under the Act is grossly inadequate and is preferred by the oil companies as opposed to complying with the phase-out of gas flaring.[29]

Another problem with the Associated Gas Re-Injection Act was its failure to regulate clearly on the party or parties who ought to bear responsibility for gas re-injection costs. Because the law is silent on this, there are uncertainties about what can be referred to as the 'responsibility sharing formula'. Should the responsibility fall on the oil companies or the Nigerian National Petroleum Corporation (NNPC),[30] or the Nigerian government? This is indecisive. Until such a time when this is resolved, the lacuna in this law will continue to lead to many more unresolved dilemmas.

Furthermore, with respect to environmental rights issues, is the failure on the part of the Associated Gas Re-injection Act not to prohibit gas flaring a violation of the fundamental human rights (the right

[25] Adejugbe, A. and Onamade, B., *Gas Flaring in Nigeria: Challenges and Investment Opportunities* (2014) available at http://www.mondaq.com/Nigeria/x/331578/Oil+Gas+Electricity/Gas+Flaring+In+Nigeria+Challenges+Investment+Opportunities, accessed 19 May 2016
[26] Oluduro, O. F. and Oluduro, O. 'Oil Exploration and Compliance with International Environmental Standards: The Case of Double Standards in the Niger Delta of Nigeria' (2015) 37, *Journal of Law, Policy and Globalization*, p. 70
[27] Ebeku (n.15) P. 207
[28] *Ibid*
[29] Coalitions for Change, Abuja *Existing Laws and Policies in the Nigerian Extractive Industries*, (2010),Nigerian Extractive Industries Transparency Initiative (NEITI), pp. 7-8
[30] Established on 1st April, 1977, NNPC is the Nigerian Oil Corporation through which the federal government of Nigeria regulates and participates in the country's petroleum industry. In addition to its exploration activities, the Corporation was given powers and operational interests in refining petrochemicals and products transportation as well as marketing- available at http://www.nnpcgroup.com/AboutNNPC/CorporateInfo.aspx, accessed 20 June, 2016

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to life as guaranteed in international,[31] regional[32] and national laws[33]) and the environmental rights[34]of Nigerian citizens especially those living in the flare locations, most of which are in the Niger Delta Region? The answer is likely in the affirmative because in effect, it is arguable that, presently, there is no law protecting the environment against the impacts of gas flaring except judicial pronouncement that sought to outlaw gas flaring in Nigeria. In the celebrated case of *Gbemre v Shell*[35] the plaintiff Jonah Gbemre for himself and as representing Iweherekan community in Niger Shell, sought to enforce their fundamental human right against Shell, Nigeria National Petroleum Corporation and the Attorney General of the Federation as defendants. In a declaratory claim, the plaintiffs alleged that the action of the 1st and 2nd respondents in continuing to flare gas in the course of their oil exploration and production activities is a violation of their right to life and dignity under the 1999 constitution and supported by Articles 4,16, 24 of the African Charter on Human and people's rights.[36] In addition, the plaintiff claimed a declaration that the provisions of sections 3(2) a,b of the Associated Gas Re-injection Act and section 1 of the Associated Gas Re- Injection (Continued flaring of gas) Regulations under which the continued flaring of gas in Nigeria may be allowed are inconsistent with the applicants rights aforesaid. Consequently, the Applicant prayed the court for an order of perpetual injunction restraining the respondents from further gas flaring in their community. In its judgment the Federal High Court held that the actions of the 1st and 2nd Respondents in continuing to flare gas in the course of their oil expiration and production activities in the Applicant's community is a gross violation of the applicants' fundamental right to life including healthy environment and dignity of human person as enshrined in the constitution. The court further held that section 3(2)a and (b) of the Associated Gas Re-injection Act and Section 1 of the Associated Gas Re-injection (Continuing Flaring of Gas) Regulation are null and void for being inconsistent with the Applicants' rights to life and dignity of human person as enshrined in the constitution. The court finally made an order restraining the Respondents from further flaring of gas and ordered them to take immediate steps to stop the further flaring of gas in the Applicants' community. It was further ordered by the court that

[31] Examples being the 1948 Universal Declaration of Human Rights (UDHR), International Covenant on Political and Civil Rights (adopted 16 December 1966, entered into force 23 March 1976) 999 UNTS 171 (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (adopted 16 December 1966, entered into force 3 January 1976) 993 UNTS 3 (CESCR)

[32] The African Charter on Human and Peoples' Rights (adopted 27 June 1981, entered into force 21 October 1986) (1982) 21 ILM 58 (African Charter)

[33]Section 33 of the 1999 Constitution of the Federal Republic of Nigeria which states that every person has a right to life, and no one shall be deprived intentionally of his life.

[34] Also known as third-generation human rights as proposed by Karel Vasak. Environmental rights are those rights which go beyond the mere civil and social rights as expressed in many international human rights documents. The United Nations Conference on the Human Environment held at Stockholm from 5 to 16 June 1972 (otherwise known as the Stockholm Declaration), recognised the need to safeguard and improve the environment. It proclaimed that; 'The protection and improvement of the human environment is a major issue which affects the well-being of peoples and economic development throughout the world; it is the urgent desire of the peoples of the whole world and the duty of all Governments.' Principle 2 of the Declaration specifically states that ; 'The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.'(United Nations Environmental Programme Page, http://www.unep.org/documents.multilingual/default.asp?documentid=97&articleid=1503 accessed 10 June 2016

[35] Unreported (Suit No FHC/B/CS/53/05 Federal High Court Benin Judicial Division 14th Nov. 2005

[36] Article 4 state that every human being shall be entitled to respect for his life and the integrity of his person. No life may be arbutrainty deprived of his right

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the Attorney General of the Federation should initiate the process for an Act of the National Assembly for the speedy amendment of the relevant sections of the Associated Gas Re-injection Act Regulations made thereunder.

Associated Gas Re-Injection (Continued Flaring of Gas) Regulation

Pursuant to the Regulations which became effective from 1 January, 1985 the issuance of certificate for continued flaring of gas is subject to any one or more of the following conditions

a. Where more than seventy five percent of the produced gas is effectively utilized or conserved
b. Where the produced gas contain more than fifteen percent impurities which render the gas unsuitable for industrial purposes.
c. Where an on-going utilization programme is interrupted by equipment failure. Provided that such failures are not considered too frequent by the minister and that the period of any one interruption is not more than 3 months.
d. Where the ratio of the volume of gas produced per day to the distance from the nearest gas line or possible utilization point is less than 50,000SCF/KM. Provided that the gas to oil ratio of the field is less than 3,500 SCF/BB1 and that it is not technically advisable to re-inject the gas in that field.
e. Where the minister in appropriate cases as he may deem fit orders the production of oil from a field that does not satisfy any of the conditions specified in the regulations.

It follows from the above that the Associated Gas Re-injection (Continued Flaring of Gas) Regulation which replaced the Associated Gas Re-Injection Act, empowered the Minister to allow gas flaring where more than 75 percent of the produced gas is effectively utilised or conserved; where the produced gas contains more than 75 percent impurities, rendering it unsuitable for industrial purpose; where an ongoing utilisation programme is interrupted by equipment failure; where the ratio of the volume of gas produced per day to the distance of the field from the nearest gas line of a possible point is more than 50,000SCF/KM.[37]

The Regulation reversed the original intention of the Associated Gas Re-injection Act, which was intended to prohibit gas flaring as a measure for environmental protection[38]. As noted earlier, one striking feature of the Act is the permission given to oil companies to continue to flare gas on the payment of minimal fees. The Associated Gas Re-Injection (Amendment) Act[39] introduced a penalty of 2 (two) kobo per 1000 standard cubic feet (SCF) of gas flared at any place. This amount was increased to 50 (fifty) kobo per 1000 standard cubic feet of gas in 1990, and the amount was further increased to 10 (ten) Naira per 1000 standard cubic feet of gas in 1998.[40] As further noted by Ebeku the amended law permits oil companies to continue flaring in particular field or fields, subject to payment of such sums as the minister may from time to time prescribe for every 28.317 standard cubic metre (scm) of flared gas[41]. It has been contended that the amount fixed is so small and cannot be a deterrent to oil companies, which are continuing with gas flaring[42] Because of the paltry penalty

[37] Ekwere, n 19 at 91
[38] Ebeku n.15 at 207
[39] Amended by Decree No. 7 of 1985
[40] Otiotio, n 13 at 27
[41] "oil and the Delta people in internation Law" (n.5) P. 207
[42] *Ibid*

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prescribed by law, oil companies would rather pay such penalties for gas flaring than incur related costs in the re-injection of produced gas.[43]

Petroleum Industry Bill

After many years of working overhauling the legislative framework of the oil and gas industry in Nigeria, the Nigerian government made a significant legislative effort to combat the menace of gas flaring in Nigeria through the Petroleum Industry Bill in 2012.[44]The Bill seeks to consolidate all existing oil and gas in the country into one piece of legislation[45]by addressing certain fundamental issues as the dichotomy between oil and gas regimes; progressive acreage management, among others.

The Petroleum Industry Bill is an Act that provides for the establishment of legal, fiscal and regulatory framework for the Petroleum industry in Nigeria and for other related matters. Part 1 of the Act lists a number of objectives which include the creation of conducive business environment for petroleum operations[46], enhancement of exploration and exploitation of petroleum resources in Nigeria for the benefit of the Nigerian people[47], creation of an efficient and effective regulatory agencies[48], among many others. Of particular interest is the provision of Part 1, Section 1, Subsection j which enumerates another objective of the Act as being to 'protect health, safety and the environment in the course of petroleum operations; for the benefit of the Nigerian people. Regrettably, this provision is a contradiction to what is obtainable in the sense that it still offers no protection on the health of citizens in vulnerable locations where gas flaring persists. A comparison of the PIB and the Associated Gas Re-Injection Act of 1979 reveals a similarity between the two legislation as the proposed Petroleum Industry Bill does not outrightly prohibit gas flaring in Nigeria. Rather, the Bill makes provision for the payment of penalties for gas flaring violations, a mere replication of the earlier Acts. Specifically, Section 201of the Bill stipulates that the 'lessee shall pay such gas flaring penalties as the Minister may determine from time to time'. There is also an added obligation on the part of the lessee to install all such measurement equipment as ordered by the Inspectorate[49] to properly measure the amount of gas being flared.[50]

Although the above regulations have contributed to the drastic reduction of the proportion of natural gas flared which was 90-99% prior to 1980,[51] it is worth mentioning that the provision of Section 201, which arrogates to the Minister the sole responsibility of determining the penalties for violations, is too open-ended and subject to the whims and caprices of the Minister. In a country where corruption is endemic, the power so granted to the Minister is likely to be abused.

[43]*Ibid*
[44]Otiotio, n 13 at 29
[45]*Ibid*
[46] Section 1 (a)
[47] Section 1 (b)
[48] Section 1 (g)
[49] Section 289 places responsible over the environment on the Inspectorate and the Agency.
[50] Section 201 (2)
[51] Aigbedion & Iyayi, n 2

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The current state of affairs in the gas industry reveals a clear reluctance on the part of the Nigerian government to prohibit gas flaring in the country. There are many plausible reasons for this status quo which include the concern by the government about the likely effect of such a prohibition on oil operations that may ultimately affect the Nigerian economy, the huge financial resources required for gas re-injection and the inability of the Government to meet their financial obligations in the various joint ventures, coupled with the lack of required infrastructural facility, and the insistence by the oil and gas companies of their inability to meet the various deadlines.[52]. The foregoing reasons notwithstanding, the time is ripe for the government to exhibit political will henceforth and desist from 'sacrificing' its citizens' right to life and a healthy environment for a buoyant economy.

The Effects of Gas Flaring

Historically, Gas flaring is said to be as old as oil exploration in Nigeria.[53]Gas flaring contaminates the air and constitutes a major source of air pollution in the Niger Delta region of Nigeria. Available evidence suggest that most of the flare stacks/sites are located within human settlement area. Human Rights Watch stated that 'in most cases gas flares are very close to communities.'[54]Although Shell Petroleum Development Company claims that this is usually because settlements have grown up around the oil facilities; local communities dispute this claim. In any event, the flares are rarely if ever relocated, or even made safe by providing secure fencing.[55]A visit to some of the communities in the Niger Delta Region did affirm this assertion, as flare sites are located close to Uquo and Ubenekang communities in Esit Eket and Ibeno Local Government Areas respectively.

The effects of gas flaring are many but they can broadly be categorised under environmental, health and other implications. Over the past fifty years, gas flaring and venting associated with petroleum exploration and production in the Nigeria's Niger Delta have continued to generate complex consequences in terms of energy, human health, natural environment, socio–economic environment and sustainable development.[56] Indeed, widespread gas flaring has inflicted untold hardship and damage to human, plant and animal life.[57]

Gas flaring contributes to climate change resulting in deleterious effects to the environment. The emission of carbon dioxide, burning of fossil fuel, mainly coal, oil and gas have led to global warming with more serious implications for developing countries, especially Africa which is highly vulnerable with limited ability to adapt.

Another notable effect of gas flaring is acid rain. The primary causes of acid rain are emissions of sulphur dioxide (SO_2) and nitrogen oxides (NO) which combine with atmospheric moisture to form sulfuric acid and nitric acid respectively. Size and environmental philosophy in the industry have very

[52]Otiotio, n 13 at 26
[53] Kassim-Momodu, M., 'Gas Re-Injection and the Nigerian Oil Industry' (1986) 6 & 7, *JPPL*, p.7
[54] Human Rights Watch homepage available at https://www.hrw.org/reports/1999/nigeria/Nigew991-05.htm, accessed 22 June 2016
[55]*Ibid*
[56]Ite, A. E. and Ibok, U. J., 'Gas Flaring and Venting Associated with Petroleum Exploration and Production in the Nigeria's Niger Delta', (2013) 1(4), *American Journal of Environmental Protection*, pp. 70-77
[57] Udok, n 11 at 64

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strong positive impact on the gas-flaring-related CO_2 emission.[58]Physically, the corrosive effect of gas flaring were obvious in affected communities such as Ubenekang in Ibeno Local Government Area and Uquo community in Esit Eket Local Government Area of Akwa Ibom State where roofing sheets have to be replaced almost every two years.[59]

Furthermore, the flares associated with gas flaring give rise to atmospheric contaminants. These include oxides of Nitrogen, Carbon and Sulphur (NO_2, CO_2, CO, SO_2), particulate matter, hydrocarbons and ash, photochemical oxidants, and hydrogen sulphide (H_2S).[60] These contaminants acidify the soil, deplete soil nutrient and stunt the growth of crops. Agricultural products like palm trees are also affected and water becomes too hot for fish to live in accounting for the depletion of fish stock in our rivers and oceans.

The destructive effect of gas flaring on wildlife has also been noted. The bright light of gas flares scares wildlife causing them to migrate[61] to more friendly territories or locations. Hutchful,[62]also acknowledges that gas flaring has been associated with 'disruption of wildlife in the immediate vicinity.'The implication of gas flaring on human health has equally been identified. The pollutants are associated with a variety of adverse health impacts including respiratory tract diseases, diseases of the central nervous system and blood steam, cancers. Deformities in children, lung damage and skin problems have also been reported.[63]

Rising temperatures which are likely to exceed 10-30 degrees with the heat potentially deadly as one approaches the flare sites have also been noticed. Villagers in both Ubenekang and Uquo communities reported that water in their rivers had become too hot for fish to survive and that plants and crops had withered away because of excessive heat from gas flares carried out in their communities. In addition to the above consequences, there is yet another effect of gas flaring which is economic in nature. Nigeria loses billions of dollars worth of gas which is burnt off daily in the atmosphere. Much of this can be converted for domestic use and for electricity generation to meet national demand. Nigeria has recorded a huge revenue loss due to gas flaring and oil spillage.[64] Though more than 65% of governmental revenue is from oil, it is estimated that about $2.5 billion is lost annually through gas flaring in government revenues.[65]

[58]Hassan, A. and Konhy, R., 'Gas flaring in Nigeria: Analysis of Changes in its Consequent Carbon Emission and Reporting', (2013) 37(2), *Accounting Forum,* pp. 124-134
[59] Udok, n 11
[60] Kindzierski, W. D., 'Importance of Human Environmental Exposure to Hazardous Air Pollutants from Gas Flares', (2000) 8, *Environmental Reviews,* pp. 41-62
[61] Human Rights Watch Report, (1994) p. 74
[62]Hutchful, E., 'Disarmament and Development: An African View' (1985) 16(4), *IDS Bulletin,* Pp. 61-67
[63] Ovuakporaye, S. I., Aloamaka, C. P., Ojieh, A. E., Ejebe, D. E. and Mordi, J. C,. 'Effects of Gas Flaring on Lung Function among Residents of a Gas flaring Community in Delta State, Nigeria', (2012) 4(5), *Res. J. Env. Earth Sci.,* pp. 525-528
[64] Effiong, S. A. and Etowa, U. E., 'Oil Spillage Cost, Gas Flaring Cost and Life Expectancy Rate of Niger Delta People of Nigeria', (2012)2(2), *Advances in Management & Applied Economics,* pp. 211-228
[65] Arowolo, A. A. and Adaja, I. J., (2011), *Trends of Natural Gas Exploitation in Nigeria and the Implications on the Socio-Economic Stability and Governance*' in 35th Nigerian Statistical Association Annual Conference.

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Prospects

In spite of its rich endowment in crude oil, Nigeria is predominantly a natural gas producing economy. However, the flaring of associated gas from petroleum exploration, production and processing continues to generate insidious environmental and energy consequences against efforts toward sustainable development for Nigeria. The preservation of the environment is an essential factor for sustainable development and poverty reduction, therefore, the need to develop environment friendly approach for utilisation of associated natural gas in the region.[66]

Oguejio for[67] has suggested a blueprint for a low-cost addition of new technology at flare installations for the conversion of flare gas pollutants into revenue-yielding fertilizers. In this respect, education and training of personnel is necessary to create awareness on related problems in order to achieve effective environmental, human health and safety. Also, there is a further need for industrial training on preventive maintenance of existing facilities and on the installation of adequate safety and pollution control equipment on the oil production and handling facilities. The socio–economic problems and environmental consequences of emission of carbon dioxide, methane gas and other emissions from flare and vent systems can be mitigated by adopting various sustainable approaches.[68]. Apart from power generation, there are ample commercial opportunities for the utilisation of natural gas, and fuel and feed stock for cement and fertilizer plants, glass manufacturing industries, food and beverage companies.[69] Furthermore, investment opportunities also exist in Nigeria for the utilisation of natural gas in the following areas: (a) natural gas liquid extraction plant and (b) compressed natural gas as an automotive fuel.[70]

As a result of the huge opportunities in both domestic and export markets, there are prospects for Nigeria to monetise the enormous natural gas resources and earn sufficient revenue from the commodity comparable to its earning from crude oil.[71]In this respect, Nigeria can explore export markets for the gas industry and boost its export earnings. There are steady export markets for Nigeria's natural gas in the industralised countries such as North America and Europe, and even in the West African sub-region.

Furthermore, the re-injection of gas will make gas affordable and enable more households use gas. Presently, gas is expensive for majority of Nigerian households who see kerosene and firewood as more pocket-friendly/convenient alternatives to gas .According to Ajayi et al,[72] liquefied natural gas provides an important commodity for domestic and industrial use. As the country industrialises and its economy becomes sophisticated, the demand for gas for industrial and domestic use increases. These demands are met by the products from LNG plants the world over and in Nigeria by the Nigeria

[66] Ite and Ibok, n 47
[67]Oguejiofor, G. C., 'Gas flaring in Nigeria: Converting Flue Gas Pollutants into Revenue-Earning Fertilizer by the Low-Cost Retrofitting of Flare Stations', (2000) 19 (2),*Environmental Education & Information*,p. 99
[68] Ite and Ibok, n 47
[69] Aigbedion and Iyayi, n 2 at 266
[70]*Ibid*
[71] Lukeman, R. 'Capacity Growth in the Nigeria Petroleum Industry', (2003), A Keynote Address Proceedings of the SPC 26th Nigeria Annual International Conference and Exhibition, Lagos, Nigeria, pp. 4-9
[72]Ajayi, D. D., Okunola, R. A. and Aiyede, E. R., 'Liquefied Natural Gas (LNG), Environment and the Society', (2012) 3(6), *Journal of Environmental Research and Management*, p. 0113

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Liquefied Natural Gas Plant (NLNG). Nigerian LNG Limited was incorporated as a limited liability company on May 17, 1989 to harness Nigeria's vast natural gas resources and produce Liquefied Natural Gas (LNG) and Natural Gas. NLNG is the biggest gas consumer and exporter in Nigeria, connoting it as a major source of eliminating gas flaring in Nigeria.[73] It has been recognised that the continued operation of NLNG is the arrowhead of Nigeria's efforts at eliminating gas flaring and its operations have helped reduce Nigeria's flaring profile from 65% to below 25%. The company also supplies about 80% of the annual domestic LPG (cooking gas) consumption.[74]

The survival of NLNG is therefore crucial in guaranteeing that Nigeria meets its target of ending gas flaring. However, there are growing concerns in that NLNG, like most government Bodies/Parastatals, are not functioning at optimal level because its overall performance is bedeviled by corruption and what has been termed the 'don't rock the boat attitude.[75]
From the foregoing, it can be concluded that the emergence of Nigeria's natural gas industry holds the key to the diversification of the nation's oil industry.[76]Diversification has the potential of increasing Nigeria's foreign exchange reserves which will subsequently reduce its dependence on crude oil whose price has reduced astronomically in recent times.

RECOMMENDATIONS

The negative effects of gas flaring especially in relation to the health of host community dwellers are a sufficient justification for ending gas flaring in Nigeria. Stringent laws must be put in place by the government to ameliorate the effects of gas flaring on the environment, health and economy of the nation. In addition to payment of fines, which in itself ought to be reviewed upwards, the government must take drastic and practical action against defaulting companies. The upward review of fines will deter defaulting companies and cause them to adopt more environmentally beneficial alternatives to gas flaring.

Furthermore, flared gas can be processed and produced into cooking/domestic gas. According to Goldberg, the natural gas currently flared in Nigeria can serve the cooking needs of 320 million people not served by modern fuels.[77]

There is also an additional call for the amendment or repeal of the 1984Associated Gas Re-injection (Continued Flaring of Gas) Regulation whichever is more applicable. According to Ekwere, one striking feature of the Associated Gas Re-Injection (Continued Flaring of Gas) Regulation is the permission given to oil companies to continue to flare gas on the payment of minimal fees. He argues

[73]*Ibid* at 0121
[74] NLNG Website available at http://www.nlng.com/Our-Company/Pages/Profile.aspx accessed 24 June, 2016
[75]Salau, S., (2015) *Leeway to More Effective Procurement Mechanisms, by NLNG Boss*, The Guardian Newspaper, 16 June 2015 available at http://guardian.ng/energy/leeway-to-more-effective-procurement-mechanism-by-nlng-boss/, accessed 25 June, 2016
[76] Aigbedion and Iyayi, n 2 at 267
[77] Goldenberg, J., 'Rural Energy in Developing Countries' (2000). In: *World Energy Assessment: Energy and the Challenge of Sustainability*. UNDP. NY.

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that oil companies would rather pay the proscribed fees for gas flaring than incur more costs associated with the re-injection of produced gas.[78]

Firm commitment from the government is also required to end gas flaring in Nigeria considering that gas flaring is currently illegal in most countries of the world. In these countries, gas flaring may only occur in certain circumstances such as emergency shutdowns, non-planned maintenance, or disruption to the processing system.

CONCLUSION

Gas flaring in Nigeria, in particular the Niger Delta region, has spanned many decades. This practice has continued in spite of the deleterious effects on the environment, human and plant life and the loss of revenue to both the government and the oil producing companies.Although the government has made efforts through legislation to control gas flaring, the laws in place have not been effective in controlling gas flaring in Nigeria. The reason is attributable to the gaps in the existing gas legislation, one of such being the permission given to oil companies to continue flaring gas in so far as they pay such penalties as would be determined by the Minister. There must be a concerted effort on the part of the government to end gas flaring in Nigeria. Gas flaring must be made illegal as it is applicable in most countries of the world. This would help protect our environment and achieve sustainable development in the Niger Delta region.

[78] Ekwere, n 19 at p. 91

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