

Ending Gas Flaring In Niger Delta Region: Does Nigeria Have The Political WillOruonye E D^{1*}, Vitalis Jafra Pontianus² and James Christopher Nwenfuh¹¹Department of Geography, Taraba State University Jalingo, Nigeria.²Department of Sociology, Taraba State University Jalingo, Nigeria.***Corresponding author**

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Gas flaring is one of the environmental and health challenges in the Niger Delta region of Nigeria in recent times. Despite the various environmental regulations and datelines set by government, the country has not been able to end gas flaring till date. Data for the study was obtained from secondary desk review of existing literature online. The findings of the study revealed that despite the fact that gas flaring is declining in Nigeria, the country is still among the top gas flaring nations of the world. Gas flaring has adversely affected the physical environment and human health in the Niger Delta region of Nigeria. The study findings revealed that Nigeria has not been able to achieve zero gas flaring despite several unsuccessful dateline target set in the past. The study argued that it is doubtful if Nigeria has the political will of ending gas flaring soon because of its heavy dependence on oil and gas revenue and inability to create conducive environment that will bring gas flaring to an end in the country.

Keywords: Gas Flaring, Natural Gas, Niger Delta, Political Will And Pollution.

Nigeria is well endowed with abundant natural gas resources. Nigeria is the leading producer of natural gas in Africa and the 9th in the world. Nigeria accounts for 2.7% of the global proven reserve of gas [1]. Unfortunately, the country is also one of the countries with the least technological capacity to harness the full potentials of the natural gas endowment [2]. Despite having a proven gas reserves of 201 trillion cubic feet (tcf) and unproven gas reserves of 600 tcf, gas production in Nigeria remains very low and unstable to meet even the local needs [3]. In Nigeria almost seventy-one million m³/day of gas is being flared while the domestic gas demand is more than half of that value [4]. The volume of gas flared in 2002 almost exceed the volume produced. There are over 171 identified gas flaring sites in the country [5]. The continuous flaring of gas over the years in the Niger Delta region of Nigeria has resulted in large scale destruction of the natural environment and human livelihood in the region, creating social tensions and various agitations built around government's inability to bring to bear the dividends of the environmental hazards the people have continued to endure and tolerate in hope for a better society. The country has over the years tried to put in place so many regulatory frameworks and measures to reduce and ultimately bring to an end gas flaring in the country. This effort seems to fail for various socio-political and bureaucratic reasons coupled with the level of corruption and lack of strong will which has been part of the Nigerian state since independence [6,7].

Over the years so many time frames have been set to achieve zero

gas flaring in the country without success. Nigeria has failed about seven times in meeting this dateline. Although recent development has shown that gas flaring in the country has declined, however, the enormity of the environmental destruction already inflicted in the region has remained a source of concern to both environmentalists and social scientists because of the pressure these destructions have continued to exact on the socio-environmental trends of the region destructions. Furthermore, the cost of addressing the destruction caused by gas flaring on the environment is far beyond the capacity of the country to handle at the moment. While Nigeria has set up a new target dateline of ending gas flaring in 2025 in the country, this study examines the dynamics of oil and gas production and gas flaring in Nigeria and how this has impacted on the physical environment and the country's economy in recent times and pose the vital question, does Nigeria have the political will of surmounting this challenge?

**Conceptual Clarification
Gas Flaring**

Gas flaring is the burning of the natural gas associated with oil extraction, which takes place due to a range of issues, from market and economic constraints to a lack of appropriate regulation and political will [8]. The practice results in a range of pollutants been released into the atmosphere, including carbon dioxide, methane, and black carbon (soot) [9]. Gas flaring is the controlled combustion of associated gas, a large volume of which make up Nigeria's gas reserves, generated during various processes including oil and

gas recovery, petrochemical process, and landfill gas extraction, into open-air [10].

When crude oil is brought to the surface it is often accompanied by a blend of gasses usually referred to as Associated Gas (AG). The composition and amount of such gasses varies between different oil fields but its major component gas is usually methane (natural gas). In order to obtain better quality oil for export the AG must be separated from the oil. Christiansen and Haugland noted that in cases where AG cannot be easily captured and used for energy purposes, flaring or burning of the gas has traditionally been considered as a safe and effective way of disposing of the unwanted AG [11]. They also note that flaring is usually preferred to venting as most of the methane is converted to CO₂ with lower impact on the environment. Gas flaring is found in most oil-producing nations; however, Nigeria is seen as one of the global hotspots [12].

Concept of Political will

Political will is one of the commonest controversial policy lexicons in development studies. Political will is defined as “the extent of committed support among key decision makers for a particular policy solution to a particular problem [13]. Brinkerhoff defined political will as “the commitment of actors to undertake actions to achieve a set of objectives, in this case, ending of gas flaring in Nigeria and sustain the cost of those actions over time [14].” Political will can also be regarded as the political intention and firm commitment on the part of a government to see a policy decision through to a successful accomplishment. Political will has remained a concept that is poorly defined and understood, which makes some scholars regard it as “the slipperiest concept in the policy lexicon” [15]. Hambergren further describes political will as “the sine qua non of policy success which is never defined except by its absence.” Political will is commonly defined as the “demonstrated credible intent of political actors” [16]. Brinkerhoff provide a more detailed and operationally oriented definition of political will as “the commitment of political leaders and bureaucrats to undertake actions to achieve a set of objectives and to sustain the costs of those actions over time” [14]. Kukutschka observed that while the above definition seems straightforward, many other authors have emphasized the fact that political will is a much more complex concept, which entails many dimensions and reflects a large and multifaceted set of underlying factors. Post et al observed that the way and manner the concept of political will is bandied about is a reflection of its presumed centrality in achieving policy change but noted that the casual usage of the concept is troublesome for those concerned with crafting, promoting, implementing, and analyzing public policies [13]. There are basically three key concerns that every political will must address, name-

ly, distribution of preferences regarding the outcome of interest, the authority, capacity, and legitimacy of key decision makers and lastly the commitment to preferences with no compromise [17,18].

Methods

Data was obtained through desk review of existing literatures on-line on oil and gas production in the Niger Delta region of Nigeria, gas flaring trend and regulations, impact of gas flaring on the environment and abatement efforts. Information was obtained through web-based generic search engines, using the snowball method to retrieve significant references. The study focused the search on papers by academics and development or non-profit organizations. Information obtained was subjected to content analysis.

Gas Flaring in Nigeria

Nigeria is the second largest gas flaring country globally after Russia. The Nigerian National Petroleum Corporation (NNPC) estimates that 40% of gas produced in Nigeria is flared and that this accounts for about 11.5% of annual global flaring [19]. According to Nigerian National Petroleum Corporation (NNPC), in 2018 alone, oil and gas firms operating in the country flared 215.9 billion standard cubic feet (scf) of the product, amounting to a revenue loss of over N197 billion [20]. According to the World Bank’s 2020 Global Gas Flaring Tracker, a leading global and independent indicator of gas flaring, Nigeria is the seventh-largest gas-flaring country globally. The country is surpassed only by Russia, Iraq, Iran, the United States, Algeria and Venezuela.

Data obtained from Nigerian gas flare tracker showed that 25.9 billion scf of gas valued at ₦460.5 billion were flared in between January to November 2019 (ICCDI AFRICA, 2020)(Table 1). The National Oil Spill Detection and Response Agency (NOSDRA), a government-run satellite tracker observed that 1.8 billion standard cubic feet (scf) per day of gas was flared in the last nine years, one that should ordinarily attract about \$3.6 billion in penalty, little of which was paid. The volume has generated 95.5 million tons of CO₂ emissions. The flared gas is valued at \$6.3 billion and it could generate 179.9 thousand GWh, according to NOSDRA report [10]. In 2020 alone, natural gas valued at \$1.24 billion was burned by oil companies, one which could generate the annual electricity use of 80 million Nigerian citizens, according to the tracker [10].

Meanwhile, Nigeria and the greater Khanty-Mansiysk Autonomous Okrug (KMAO) region of Russia have both achieved significant progress over the past 15 years, with Nigeria reducing its gas flaring by 70 percent to just 7 bcm in 2020, and KMAO reducing its gas flaring volumes by nearly 80 percent, to just over 4 bcm [9].

Table 1. Gas Flaring in Nigeria

Year	Volume of Gas Flared per thousand scf	Average Price of Gas per thousand scf	Revenue loss in \$	Revenue loss in ₦
2014	393,839,836	2.50	984,600,000	301,287,600,000
2015	330,933,000	2.40	794,240,000	243,037,440,000
2016	288,917,198	2.60	751,185,000	229,862,610,000
2017	324,192,401	2.70	875,320,000	267,847,920,000
2018	282,080,000	2.70	761,616,000	233,054,496,000
2019	25,900,000,000			460,500,000,000
2020			1,240,000,000	

Source: Adapted from PwC analysis [3].

Were the gas harnessed, it could have been used to feed the national grid and used to generate power and electricity, which around 80 million Nigerians do not have access to, according to the World Bank. Yet, without conducive environment such as revamped power infrastructure, friendly regulation, gas-to-power investment, overcoming Nigeria's power challenges will remain a nightmare.

Gas Flaring Regulations in Nigeria

There are many regulations that have been put in place to end gas flaring in Nigeria. Some of these regulations include;

i. The Petroleum Act of 1969 – this is the Nigerian government's first legislation on oil and gas industries after independence. The Federal Government of Nigeria promulgated these laws and policies aimed at stopping gas flaring in 1969 After manifestation of the impact of the oil and gas activities on human health and environment [21].

ii. Associated Gas Re-Injection Act (AGRA) of 1979 which provides that each oil and gas producing company should submit a detailed plan for either the re-injection or commercial use of all associated gas produced by 1st October 1980. It also made gas flaring illegal as from 1st January, 1984.

iii. Associated Gas Re-Injection Act (Continued Flaring of Gas) Regulation of 1985. The Act give right to Nigerian Government to utilize any gas at flare point free of cost. The Act allowed the minister to authorize companies to flare gas that cannot be re-injected or utilized by charging fee for such flaring and can impose such conditions as he deems fit. The penalty for flaring gas after the 1st January 1984 without the permission of the Minister was forfeiture of the company's oil mining concessions.

iv. Gas Flaring Penalties from 1988 – 2008. The Associated Gas Re-Injection (Amendment) Act, put a penalty of two kobo per 1000scf of gas flared in areas where gas flaring emissions were not granted. Later, the fine was increased to fifty (50) kobo per 1000scf of gas in 1990. Further increase of the penalty was made in 1998 to ten (10) Naira per 1000scf of gas. Then lastly the fine was increased to \$3.50 per 1000scf in April 2008 [21].

v. Nigeria LNG (Fiscal Incentive Guarantee and Assurances) Decree of 1990, amended in 1993 and became Law of the Federation of Nigeria 2004. The Act was established as the incentive to encourage and facilitate the development of the NLGN project as a way of reducing gas flaring [21].

vi. The 1999 Constitution as the supreme law of the Nigerian Federation has provision for the protection of the environment against any adverse effect including gas flaring.

vii. West African Gas Pipeline Project (Ratification and Enforcement) Act. In an effort to enhance gas utilization, the Nigerian government entered into a treaty with three West African countries for the West African Gas Pipeline Project (WAGP) in January 31, 2003 [22].

viii. Petroleum Profit Tax Act. The government came up with this Act to provide incentives to industries that will be utilizing the gas instead of flaring it. The gas utilization opportunities include Independent Power Projects (IPPs), Liquefied Natural Gas (LNG), Natural Gas Liquids (NGL), Gas-to Liquids (GTL), West African Gas Pipeline (WAGP) and Domestic Gas Utilization [22].

ix. Petroleum Industry Bill, 2012 make provisions for ending gas flaring in the country. The Bill seeks to consolidate all existing oil and gas laws in the country and prohibits gas flaring after a specified date to be fixed by the minister through regulations [22].

x. As an alternative, the government, in 2016, commissioned the Nigerian Gas Flare Commercialization Programme with the mandate to eliminate gas flaring and possibly boost the economic potential of gas by 2020.

xi. The gazetted flare gas (prevention of waste and pollution) regulations 2018 which provides a framework to support the objectives of the Federal Government for the reduction of Green House Gas (GHG) emissions through the flaring and venting of natural gas.

xii. The Federal Government of Nigeria came up with the National Gas Expansion Programme which made the year 2020 as the year of gas which will bring to an end all forms of gas flaring by the year 2025.” The Nigeria President also pledged to achieve net zero emissions of gas by 2060 at the 2021 climate change conference in Glasgow. Nigeria was also a signatory to the World Bank’s Global Gas Flare Reduction Partnership which gave the country the mandate to end all forms of gas flares by the year 2030.

Apart from legislative framework, the Nigerian government equally established institutional framework to regulate gas flaring in the country, these include: The Federal Ministry of Environment (FMEnv), the Department of Petroleum Resources (DPR), the Nigerian National Petroleum Corporation (NNPC), The Department of Environmental Assessment (DEA), the National Environmental Standard Regulation and Enforcement Agency (NESREA) and the National Oil Spill Detection and Response Agency (NOSDRA) among others.

Reasons for Continuous Gas Flaring

There are circumstances that made it necessary for oil companies to engage in gas flaring despite the high economic and environmental cost associated with it. Some of these conditions include;

i. Corruption – the endemic and pervasive nature of corruption in the country among officials in the industry, politicians and multi-national oil and gas companies made it difficult to end gas flaring in the country to date.

ii. Inadequate gas extraction as a result of the poor technology used in oil and gas production in the country. Gas flaring is avoidable and preventable through the use of technology (e.g., by installing low-bleed controllers, vapor recovery units, improved compressor seals) or the application of better maintenance and best practices programs. This often requires capital investment which makes them uneconomic or marginally economic (U.S. Energy Department, 2019) [23].

iii. Inadequate processing and transportation infrastructure that will help in moving gas from point of production to end users. Flaring of associated gas is sometimes unavoidable for oil drilling in new areas that lacks natural gas pipelines. Several wells may be drilled and produced for a long time before a company determines the level of investment in production facilities and pipelines that will be required to meet economic standards. Thus, for gas flaring to stop, the volumes, pressures, and rates of associated gas production needs to be sustainable at levels that can economically justify installation of new gas gathering infrastructure or expansion of existing infrastructure [23].

iv. The need to reduce and prevents over-pressure on industrial plant equipment. The gas is flared to avoid pressure buildup in crude oil, condensate (light liquid hydrocarbons recovered from lease separators or field facilities at associated and non-associated natural gas wells) [23].

v. Nigeria’s heavy dependence on revenue from oil and gas. Nigeria needs this revenue and cannot afford to shut down the international oil companies because of gas flaring. The government under the present arrangement takes majority of the oil revenues. Hence, stringent enforcement of gas flaring regulations will adversely affect the revenues that will accrue to the government, so the legislature and the government agencies relax the rules to allow for a continuous production of oil and gas [21].

vi. Weak legislative framework – some of the laws made by the National Assembly to address the problem of gas flaring in the country are weak and not effective in addressing the issue. The 1984 amendments of the AGRA were done to allow for continued flaring of associated gas with permission of the presiding minister, subject to the payment of penalties which is small compared to the cost of gas re-injection or utilization [21].

Environmental Impact of Gas Flaring

Gas flaring is one of the environmental and health threat which ranges from;

i. Gas flaring cause pollution of the atmosphere through the release of excess amount of carbon dioxide and methane which results in depletion of the ozone layer. In 2019 about 22.6million tons of carbon dioxide were emitted into the environment as a result of gas flaring in Nigeria [3].

ii. Gas flaring has been associated with the formation of acid rain in the area. These acid rains have caused much destruction on the environment, destroyed crops, corroded roofs of houses in the region and adversely affect human health [24].

iii. Climate Change - gas flaring is also contributing to problem of global warming. Gas flaring contributes to climate change by emission of carbon dioxide, the main greenhouse gas associated with the activity.

iv. Gas flaring emits black carbon (soot), methane and volatile organic compounds which are dangerous air pollutants into the atmosphere in the region. The black soot is most common during the dry season in the atmosphere over the Niger Delta region and Port Harcourt town in particular. The black soot has been linked to many adverse respiratory, skin and reproductive conditions [25]. In the oil-rich Niger Delta, 2 million people live within 4 kilometers (2.5 miles) of gas flare , which makes them more vulnerable to several health issues including cancer and lung damage, as well as deformities in children, asthma, bronchitis, pneumonia, neurological and reproductive problems [26,27].

v. Agriculture - The flares associated with gas flaring give rise to atmospheric contaminants. These include oxides of Nitrogen, Carbon and Sulphur (NO₂, CO₂, CO, SO₂), particulate matter, hydrocarbons and ash, photochemical oxidants, and hydrogen sulphide (H₂S) [28-29]. These contaminants increase the acid content of the soil, thereby reducing the available soil nutrient.

vi. Effect on human health - Gas flaring has adverse effects on human health, especially local communities that are exposed to the hazardous air pollutants emitted during incomplete combustion of gas flare. These pollutants have the potentials of causing health challenges such as cancer, neurological, reproductive and developmental disorders. It can also cause deformities in children, lung damage and skin problems [30]. Hydrocarbon compounds are known to have adverse effects on blood and blood-forming cells that could lead to anemia (aplastic), pancytopenia and leukemia [29].

vii. Noise pollution – in Niger Delta region, gas flaring causes much noise that the local people have to shout to hear each other. This is further worsened by the fact that many of the gas flaring sites are close to local communities. For example, Ikelegbe reported that the Utorogun gas plant in the Niger Delta area created much noise and vibrations on the land and houses at about 6 kilometers radius from it [31].

The environmental cost of gas flaring has been estimated to over ₦28.8 billion (US\$94 million) annually according to the report of the National Environmental, Economic and Development Study (NEEDS) for Climate Change in Nigeria (PwC, 2019). This according to the World Bank, this is just the cost of reducing or eliminating CO₂ emissions and or the economic cost of the damages to the physical and biological environment caused by CO₂ emissions. This will require planting 7.5 million hectares of trees that will absorb 638 million cubic tons of carbon from gas flaring and others sources of carbon emission in the country [3].

The enormity of the impact of gas flaring on the environment has attracted public outcry and condemnation. This public outcry has forced international oil companies operating in Nigeria to cut down on their emissions level. This is further necessitated by the increasing public awareness of the environmental regulations on gas flaring in the country.

Does Nigeria Have the Political Will?

There are situations that necessitated the above questions. The Nigerian government has not enforced environmental regulations effectively because of the overlapping and conflicting jurisdiction of separate governmental agencies governing petroleum and the environment as well as because of non-transparent governance mechanisms [32].

This has resulted into setting many datelines target for ending gas flaring without success. The first target was set in 1979 under the Associated Gas Re-injection Act of same year. When this was not met, another dateline of 1984 was set. By this second dateline, gas flaring was made illegal in the country. Following the dawn of civilian administration in 1999, oil companies were required to end flaring of gases by 2003. This dateline failed and a new dateline was set by 2004. This was later extended to January 2008, and again to December 2008 [22,33]. After 2008, the oil companies

operating in the Niger Delta region use the insecurity prevailing in the area as the reason for their inability to stop gas flaring and agreed to stop gas flaring by 2010 especially Chevron and Mobil companies. By 2010, the oil companies opted to pay fine for their inability to stop gas flaring in the region as an escape to sanction by the Nigeria government [22]. Unfortunately, this fine for gas flaring was far cheaper than the cost of stopping the gas flaring and the companies prefer to pay the cheap fine than to stop the flaring of gas in the area. To make matters worse, getting information on the actual quantity of the gas flared and the corresponding fine was made difficult by corruption in the country. In some instance, the oil companies evade payment of the fines by bribing government officials.

The Nigerian government extended the dateline of ending gas flaring in the country to 2020. Following the covid-19 pandemic this dateline was not achieved. Another dateline was now set at 2025. Recent development has revealed that Nigeria has greatly reduced gas flaring to a very minimal level of eight per cent [10]. This notwithstanding, the inability of the Nigerian government to develop the required infrastructure and address other issues necessary to stop gas flaring in the region creates an atmosphere of doubt and uncertainty to the attainment of this new dateline. The continuous amendment of the gas flaring regulations and postponement of the abatement date with the payment of penalty that is too small and does not serve as a deterrence to oil and gas companies, has encouraged the companies to pay the penalty with ease rather than utilize the gas. This according to Abdulkadir et al demonstrates lack of seriousness and political will on the part of the government to end gas flaring in the country [21].

Dimensions Of Political Will

i. Strong regulatory institutions – it takes political will to have strong regulatory institutions that will effectively enforce the gas flaring regulations. At the moment, these existing institutions such as NESREA, NOSDRA and DPR oftentimes have overlapping responsibilities and weak structure to effectively enforce the regulations.

ii. Effective Enforcement of gas flaring regulations – political will is required to ensure that all violators of gas flaring regulations are brought to book and that no one is above the laws of the land.

iii. Acquisition of technological capacity – it takes political will to acquire modern state of the art equipment for effective monitoring of gas production, gas flaring amount and the corresponding penalty (fine) for violation of the regulation.

iv. Prompt prosecution of violators of gas flaring regulation – political will is also required to promptly prosecute violators of gas flaring regulations in the country.

v. Financial support for enforcement of gas flaring regulations – it takes political will to make adequate financial provisional backup

to the institutions enforcing the gas flaring regulation and reduce the corrupt tendencies associated with this.

Conclusion

This study has examined the dynamics of oil and gas production in Nigeria, trend of gas flaring and impacts on the environment as well as effort to end gas flaring in the country. The study findings reveal that there is need for strong political will to effectively bring gas flaring to an end in Nigeria. This political will entail strengthening the institutional and legislative framework on gas flaring, development of gas infrastructure and creating an enabling environment that will attract key players in the industry and expansion of local markets. The study findings reveal that gas flaring has caused enormous economic losses to the country and adversely impacted on the physical environment and human health in the Niger Delta region. Ending gas flaring will therefore bring about huge economic fortune to the country.

Recommendations

Based on the findings of the study, the following recommendations are made;

i. There is need to increase the penalty charges imposed on gas flaring as the current rate is too cheap for oil companies. The 2018 gas flaring regulations, which increased the charges on gas flaring, should be adequately enforced.

ii. There is insufficient infrastructure to process and transport gas to end-users in the country. The Federal Government would therefore need to pay more attention to the development and expansion of critical infrastructure such as gas processing technologies and distribution pipelines to enhance the movement of gas from oil fields to the end-users.

iii. There is need for government expansion of domestic gas utilization locally within the country by addressing institutional challenges in the gas market which make the cost of processing and transporting gas more expensive than the income from its sale. These efforts will increase incentives to investors in gas processing and utilization sector.

iv. Significant amount of gas in oil-fields which makes greater re-injection impossible; and the country's heavy dependence on crude oil for revenue.

v. Investments in petrochemical industries should be encouraged. These industries utilize gas to produce polymers, ammonia, hydrogen fuel for cars, etc. We can borrow a leaf from Russia where the petrochemical industry is on the rise, with companies like Sibur leading the way. According to the company's data, in 2018, through recycling hydrocarbon byproducts of oil and gas extraction (about 22.3 billion cubic meters of gas), it helped reduce greenhouse-gas emissions by 71 million metric tons (Frolovskiy, 2019).

vi. There should be increased investment in power generation using gas. The government should embark on recovery of flared gas and direct it to electricity generation. This would help reduce the quantity of gas flared and also increase the nation's electricity capacity.

vii. Oil companies should include gas processing technologies during the development of new oil-fields, and also ensure transparency while reporting to authorities, the quantity of gas flared.

viii. Concrete efforts should be made to diversify the Nigerian economy to reduce dependence on crude oil for national revenue. Reduced dependence on petroleum would increase the government's tenacity in enforcing measures against gas flaring in the Country. Agriculture, tourism, and processing can provide alternative sources of revenue [34].

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