

An Assessment of the Role of Nigerian State in Enforcing Zero-Gas Flare Regime, 1979-2012: The Imperatives of Environmental Diplomacy

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Abstract

Gas flared in association with the production of crude oil began in Nigeria under the British Colonial rule when Shell began oil production in 1958, and with the increasing production of oil, the volume of gas flared in the process of oil production increased. In Nigeria alone, gas flaring amounts to about 23 billion cubic metres per annum of the gas generated in association with crude oil production in over 100 flare sites, constituting over 13 percent of global gas flaring out of the over 150 billion cubic metres of natural gas flared and vented annually. This translates to greenhouse gas emission of 45 million tons of CO₂ out of the global total of 400 million tons annually. Even as the environmental effect of gas flaring is trans-boundary or global in terms of global warming and climate change, it has some negative environmental and health impacts on the immediate or local environment. Economically, Nigeria lost about \$72 billion in revenue between 1970 and 2006 due to gas flaring; and currently, loses about \$2.5 billion annually for flaring associated gas. The paradox is that the volume of gas flared annually in Nigeria can match the country's energy need and resolve the energy crisis. Among other measures, Nigerian government has set various deadlines for elimination of gas flaring but none of these zero-gas flaring deadlines has been achieved. The paper concludes that this is due to rentier character of the Nigerian state, rentier mentality of the Nigerian rentier (ruling) class and rentierism of the Nigerian economy.

Keywords: Oil, gas flaring, zero-gas flare regime, rentierism, environmental diplomacy, Nigeria

1. Introduction

Gas flared in association with the production of crude oil began in Nigeria under the British Colonial rule when Shell began oil production in 1958, and with the increasing production of oil, the volume of gas flared in the process of oil production increased (see Appendix I). In Nigeria alone, gas flaring amounts to about 23 billion cubic metres per annum of the gas generated in association with crude oil production in over 100 flare sites, constituting over 13 percent of global gas flaring out of the over 150 billion cubic metres of natural gas flared and vented annually. This translates to greenhouse gas emission of 45 million tons of CO₂ out of the global total of 400 million tons annually. Consequently, Nigeria lost about \$72 billion in revenue between 1970 and 2006 due to gas flaring. Currently, Nigeria loses about \$2.5 billion annually for flaring associated gas (Kaldany, 2006). Flaring of associated gas emits a greenhouse gas (GHG) which contributes to global warming and climate change with flaring emissions currently estimated at about 400 million tons of carbon dioxide into the atmosphere each year. Globally, flaring and venting of gas in petroleum production, therefore, waste a valuable energy resource worth approximately 30.6 billion dollars each year, and harms the environment (GGFR, 2012). The paradox is that the volume of gas flared annually in Nigeria can match the country's energy need and resolve the energy crisis (Agboola, Nwulu, Egelioglu and Agboola, 2011).

Although the environmental effect of gas flaring is trans-boundary or global in terms of global warming and climate change, it has some negative effects on the immediate or local environment (Christansen and Haugland, 2001). For example, flares contains as many as 250 toxins and flares emit particulate matters including sulfur dioxide, nitrogen dioxide and carcinogenic substance as well as unburned fuel hydrogen sulfide several of which can cause aggravated asthma, cough, chronic bronchitis, decreased lung functions, difficult or painful breathing and premature death. Flares create acid rain corrosive to metal roof, acidifies lakes and streams and kills vegetation. Ibeanu (2008) also points out that flaring gas within the vicinity of human dwellings is conducive to acid rains, and causes devastation of farmland and fishing waters, deforestation and destruction of wildlife and as well threatens resource flows and livelihoods (Nwankwo and Ogagarue, 2011).

By late 1970s and mid-1980s, the Nigerian government in a bid to reduce gas flaring enacted various gas re-injection policies or laws that imposed fines on oil majors for the quantity of gas flared during oil production. Apart from placing fines on international oil companies (IOCs) for the quantity of gas flared during oil production, Nigerian government has set various deadlines for elimination of gas flaring but none of these zero-gas flaring deadlines has been achieved. Paradoxically, the revenue Nigerian government generates from oil is less than what it loses in gas flaring annually in terms of environmental degradation, waste of energy resource, agricultural and human resources (see Appendix II). However, the government is preoccupied with maximizing oil revenue at the short term than in making long term commitments toward achieving gas flare-out regime. In other words, Nigerian government is not prepared to make short-term sacrifice of losing oil revenues necessary

for achieving zero-gas flaring. Consequently, the Nigerian government is only concerned with the immediate gain than the future gain (Agboola, *et al*, 2011; Kingston, 2011).

Thus, the Nigerian government and its agency in oil sector, NNPC, are much more interested in increasing oil export revenue through increased oil production than to drastically peg oil production to the capacity of gas utilization facilities while oil multinationals are investing more in oil production to maximize profits through increased oil production than investing to increase the capacity of gas utilization facilities. As a result Nigeria has only been able to enforce marginal reduction of gas flaring. Thus, the joint venture partners are more interested in increasing oil production for more revenues or profits than increasing the capacity of gas utilization facilities. The bottomline is that the Nigerian government prioritizes economic diplomacy over environmental diplomacy thereby impeding its role in enforcing zero-gas regime.

The focus of this study therefore is to examine the role of the Nigerian government in enforcing zero-gas flaring policy. The paper thus argues that due to rentier character of the Nigerian state, rentier mentality of the Nigerian rentier (ruling) class and rentierism of the Nigerian economy, the government has not been successful in enforcing these deadlines on oil multinationals. To do this, we divided the paper into four main parts. The first part is "Introduction" that introduces the paper. The second part describes or discusses the theoretical perspective for understanding the inability of the Nigerian government to enforce zero-gas flaring policy. The third part is "Gas Flaring Reduction and Elimination Efforts of the Nigerian Government" which describes the various efforts of the Nigerian government in enforcing gas flare out regime. This second part is subdivided into four parts: (i) Nigerian Government and the Legal Frameworks for Enforcing Gas Flaring Reduction and Elimination; (ii) Nigerian Government and Provision of Incentives for Gas Flaring Reduction and Elimination; (iii) Economic Diplomacy versus Environmental Diplomacy and the Role of the Nigerian Government in the International Initiatives for Gas Flaring and Climate Change Mitigation; and (iv) Nigerian Government, Rentierism and Zero-Gas Flaring Deadlines. Finally, the fourth part is "Conclusion" which summarizes the paper and makes recommendations on the basis of findings.

2. Theoretical Discourse

This study is essentially predicated on the theory of the rentier state. According to Beblawi and Luciani (1987), a rentier state is a term used to classify those states which derive all or a substantial portion of their revenues from the rent of indigenous resources to external clients and the creating in the same process a rentier mentality and a rentier class in these states. For Mahdavy (1970), rentier states are usually blessed with abundant mineral resources like oil and gas, and therefore, rely essentially on rent seeking, that is, earning of income by capturing economic rent through manipulation or exploitation, rather than by earning profits through economic transactions and production of added wealth.

The theory of rentier state states that countries that receive substantial amounts of oil revenues from the outside world on a regular basis tend to become autonomous from their societies, unaccountable to their citizens and in fact autocratic. The theory is, therefore, used to explain why Iran and other Gulf states and some African states like Nigeria, Gabon, Angola, etc, with abundant resource wealth perform less well than their resource poor counterparts (Schwarz, 2007). Thus, Mahdavy (1970) wonders why the oil exporting countries are not among the fastest growing economies of the world in spite of the extraordinary resources that are available to them. He further observes that there is a complacent attitude among the rentier states which contrasted vividly with the sense of alarm and urgency prevalent in most other underdeveloped countries with massive impoverishment of the general populace and general backwardness. According to Mahdavy (1970):

Whereas in most underdeveloped countries, this kind of relative regression will normally lead to public alarm and some kind of political explosion aimed at changing the status quo... in a rentier state, the welfare and prosperity imported from abroad preempts some of the urgency for change and rapid growth, and may in fact coincide with socio-political stagnation and inertia.

Mahdavy (1970), further, notes that rentier economies are like other monoproducers, highly vulnerable to external price shocks and rather than diversifying their economies, most rentier states waited out the crash by implementing austerity measures. According to him, therefore:

However one looks at them the oil revenues received by the government of the oil exporting countries have very little to do with the production processes of their domestic economies. Input from local industries, including wages and salaries, payment to local contractors and purchase of local supplies is so insignificant that for all practical purposes one can consider the oil revenues as a free gift of nature... As a result, the petroleum industries in the oil rentier states tend to be enclave industries that generate few backward or forward linkages.

Beblawi (1990), however, delineates four basic characteristics of a rentier state which are (a) rent situations must predominate in that there is no such thing as a pure rentier economy (b) the rent must come from abroad or outside the country (c) in a rentier state only the few (i.e. the rentier class) are engaged in the generation of rent while the majority is involved in its distribution and consumption meaning that the

government functionaries or political leaders (i.e. rentier class) make the deals and take in the revenue, and then allocate to the public that is not involved in creation of wealth and (d) the government must be the principal recipient of the external rent in the economy meaning that the rents accrue to the government directly.

The implications of the above characterization is that rentierism often transforms rentier states into mono-product or mono-cultural economies where (i) the little productive activities are mainly confined at the level of primary production necessary for oil exploration (ii) there is predominance of public sector over private sector (iii) there is in the private sector the dominance of informal sector over formal sector. Beblawi (1990), thus, notes that the above state of affairs creates a “rentier mentality”. He describes rentier mentality as:

A psychological condition with profound consequences for productivity where contracts are given as an expression of gratitude rather than as a reflection of economic rationale; civil servants see their principal duty as being available in their offices during working hours, businessmen abandon industry... the best and brightest abandon business and seek out lucrative government employment; manual labour and other work considered demeaning by the rentier is farmed out to foreign workers whose remittances flood out of the rentier economy.

Furthermore, Beblawi (1990), identifies several other characteristics particularly associated with “rentier” oil states. For example, where the government is the largest and ultimate employer of labour, the bureaucracy is frequently bloated, ineffective and inefficient because jobs are given mainly for patronage purposes and political reasons. Similarly, Ifesinachi (2007) following Moore (2004) observes that in a rentier state there exists little incentive to establish efficient public meritocratic bureaucracy, because the task of raising revenue from mineral resources requires few specialists and these may be imported. In addition, local laws often make it impossible for foreign companies to operate independently. This leads to a situation where citizenship becomes a financial asset. In order to do business, foreign enterprises engage a local “sponsor” who allows the company to trade in his name in return for a proportion of the proceeds (Herb, 2002).

In the same vein, Luciani (1990) notes that rentierism is linked to the emergency of weak states in which a high level of rentierism will negatively affect the function of the modern state to represent its citizens or perform her representation function. Rentierism transforms a rent-seeking state into an allocation or a distributive state, instead of being a production state (Anderson, 1987). A production state relies on taxation of the domestic economy for its income while an allocation state does not depend on domestic sources of revenue, because external rents liberate it from the need to extract income from the domestic economy (Khouri, 2008).

However, by liberating itself from the necessity of tax collection, the rentier state unwittingly diminishes its own administrative capacity (Feldman, 2003). In other words, so long as the ‘prosperity’ of the rentier state derives from external rent, technological and organizational improvements will remain underdeveloped and real economic development illusory (Smith, 2004). Consequently, Beblawi and Luciani (1987) notes that since the government in a rentier economy distributes benefits; the opposition, rather than focusing its attention on the underlying rentier state dysfunction, rattles on about how benefits are distributed (Moore, 2004).

The Nigerian state is, indeed, a rent-seeking state relying on oil revenue received from rents or royalties paid by oil and gas multinationals in their exploration and exploitation of oil and gas in Nigeria. For instance, oil and gas constitute nearly 90% of Nigerian revenue and foreign exchange earnings showing that Nigeria is a mono-product or mono-cultural economy where oil is the mainstay of the economy. Rents, therefore, predominate in Nigeria. Thus, the Nigerian state satisfies all the characteristics enumerated by Hazim Beblawi, which qualifies it to be referred to as a rentier state, specifically a rentier-oil state. In Nigeria, for example, rents or royalties accrue directly to the Nigerian state and only few, that is, the government functionaries are engaged in its generation, the rest are involved in its distribution. The implication of the above is that the Nigerian state is an allocation or a distributive state, and not a production state. Even the few productive activities in Nigeria are confined to the level of primary production, specifically exploration and production of oil and gas (i.e. upstream oil sub-sector) by the oil and gas multinationals.

Therefore, the analytical utility and usefulness of rentierism in this study stem from the fact that it more than any other theory captures the very essence of the political economy of non-enforcement of gas flare-out regime in Nigeria, and as well the fundamental and primary concerns of the joint venture partners like the Nigerian government represented by NNPC and oil multinationals. Rentier state theory has high analytical value in that it is adequate and apt for explaining the three major issues raised in this study. These three major issues are captured by the four main contradictions of the joint venture partners in Nigeria as identified by rentier state theory such as (a) contradiction between rents or revenues and environment, (b) conflict between profits and environment, (c) tension between national security and environmental security, and (d) contradiction between increase in oil production and efficient utilization of natural resources. In summary, there is conflict between economic diplomacy and environmental diplomacy.

For example, contradiction between rents and environment, conflict between profits and environment, contradiction between increased oil production and efficient utilization of natural resources, and tension between

national security and environmental security or security of the local population living in the immediate environment explain the reason why explain the reason why the Nigerian state is concerned for increase in oil production and revenues more than the environmental harmful effects of gas flaring to the immediate environment in the Niger Delta. Due to the rentierism or rentier character of the Nigerian state and the associated rentier mentality of the Nigeria's rentier class, Nigeria places premium on collection of oil revenues accruing as rents or royalties more than on protecting the environment of oil communities in the Niger-Delta. The import of this is that a country that depends largely on oil revenue to offset its expenditure cannot in all sincerity enforce zero-gas flaring deadline in oil and gas multinationals. The major concern of the Nigerian state is to increase oil revenues through higher oil production without recourse to the capacity of associated gas gathering facility at the expense of oil communities. The Nigerian government and its agencies in oil sector, NNPC, are much more interested in increasing oil export revenue through increase oil production than to drastically peg oil production to the capacity of associated gas utilization facilities or fund available to meet the flare-out target.

From the foregoing therefore rentier state theory is able to make us understand that the fundamental concerns of the joint venture partners is increase in crude oil production though for different reasons. For examples, the reason for Nigerian state and its agency, NNPC, is increase in oil revenues defined as national security. Finally, for oil multinationals in Nigeria, the reason is to increase or maximize profits. Under this state of affairs, achieving zero-gas flaring becomes rhetoric and as such secondary.

3. Gas Flaring Reduction and Elimination Efforts of the Nigerian Government

Most of the crude oil reserves in Nigeria are mixed with natural gas and produced in association with gas. Not surprisingly, the exploration and production of natural gas in Nigeria was accidental to the production of crude oil in 1958 under the British colonial rule. Most of these volumes of gas, though insignificant, were flared. All available data show that gas production; utilization and flaring have increased since then at least in absolute terms. In other words, Nigerian government has been able to reduce gas flaring in relative terms but not absolute terms. For details, see Appendix III and Table 1 below. It is not as if the inability of the Nigerian government to stop gas flaring in Nigeria is because of lack of trying. Nigerian government has made several efforts to reduce and eliminate gas flaring since 1969 to no avail. Some of these efforts include legal and regulatory frameworks, fiscal and economic incentives, international engagements and initiatives, and setting of zero-gas flaring deadlines. We subsequently discussed these measures in different sub-headings below.

3.1. Nigerian Government and the Legal Frameworks for Enforcing Gas Flaring Reduction and Elimination

Nigerian government had enacted several laws for curbing gas flaring namely the 1969 (Drilling and Production) Regulation, the 1973 Petroleum Amendment Decree, the 1979 Associated Gas Re-injection Act, the 1983 Associated Gas Re-injection (Amendment) Act, the 1985 Associated Gas Re-injection (Amendment) Decree, the 2004 Associated Gas Re-injection (Amendment) Act, and finally, the 2010 Associated Gas Re-injection Bill. Yet gas flaring by oil multinationals continue in spite of these gas flaring regulatory regimes, either because the laws are defective or that they are not properly implemented or enforced (Christiansen and Haugland, 2001; Ibikunle, 2006; Malumfashi, 2007; Aghalino, 2009; Ogbara, 2009; Buzcu-Guven, Harriss and Hertzmark, 2010; Oluduro, 2011; Ukala, 2011).

The 1969 Petroleum (Drilling and Production) Regulation Decree No. 51 provides that licensee or leasee must submit feasibility study, programme or proposal for gas utilization not later than five years after the commencement of production. But the decree failed to provide adequate penalty for violation. In fact, the 1969 Regulation does not carry any penalty clause as it allows the producers to flare gas for five years before feasibility study. In spite of this, the oil majors operating in Nigeria were not able to meet up or comply. Nigerian government on their part was not able to enforce the regulation as the law made no provisions for sanctions against non-compliance. The 1969 Regulation was thus inherently defective or flawed (Ibikunle, 2006; Malumfashi, 2007; Aghalino, 2009; Oluduro, 2011; Ukala, 2011). While under the 1973 Petroleum (Amendment) Decree, the government may take gas flare at no cost. Yet absence of infrastructure to develop and utilize the produced gas resulted to non-compliance.

The 1979 Associated Gas Re-injection Decree No. 99 required oil companies to submit proposals or detailed plan for gas utilization or re-injecting gas into the earth crust, and empowers the Minister of Petroleum Resources to grant permission to flare on certain conditions. Thus, no company without facilities for associated gas utilization shall be permitted to engage in oil production unless issued certificate of permission by the Minister as from January 1, 1984. The decree set the limit of October to April 1980 for the oil companies to develop gas utilization projects and to stop gas flaring by 1984, or face fines, for example, acreage may be forfeited for violation (Ainablankson Newsletter, April 2011).

However, major oil companies in Nigeria indicated difficulties in meeting the 1984 deadlines citing lack of finance to construct a gas re-injection plant within the time frame. Consequently, the deadline was extended

by one year, yet oil companies failed to adhere to the provisions or stipulations claiming that it was too expensive to re-inject gas. As such, approximately 55 percent of oil fields were exempted from participating in gas re-injection with issuance of certificate of permission from the Ministry at an insignificant fee. The 1979 Associated Gas Flaring Re-injection Decree allowed the Minister to permit gas flaring for a period of thirty days in the cases of start-up equipment failure or shut down without having to pay for such gas flared (Ibikunle, 2006; Malumfashi, 2007; Aghalino, 2009; Oluduro, 2011; Ukala, 2011).

The 1983 Associated Gas Re-injection Amendment Act introduced specific penalty for the first time and extended the deadline by one year. Although penalty existed it was not sufficient to serve as a deterrent. The 1985 Associated Gas Re-injection Amendment Decree 7 permits a company engaged in the production of oil or gas to continue to flare gas in a particular field(s) on the payment of a fee prescribed by the Minister on issuance of certificate stating that gas utilization or re-injection was inappropriate for the field in question. The decree fixed a fine of 2 Kobo equivalent of \$0.0009 for each 1000 standard cubic feet (scf) of gas flared at the fields where permission to flare was not granted. In 1990, the penalty was increased to 50 Kobo or ₦0.50 Naira per 1000 standard feet of gas flared. In 1998, this penalty was increased twenty-fold from 50 Kobo (0.50 Naira) to 10 Naira (about \$11) for every 1000 standard cubic feet of gas flared. These penalties were generally considered too meager or insignificant to serve as a deterrent to oil companies to reduce or stop gas flaring. Even at that it was not quite clear whether the government's motive was to end flaring or raise revenue (Ibikunle, 2006; Malumfashi, 2007; Aghalino, 2009; Oluduro, 2011; Ukala, 2011).

The 2004 Associated Gas Re-injection (Amendment) Act made it compulsory for all companies operating in Nigeria to submit their detailed plans for utilization of gas produced and retains most of the provisions of earlier laws like prohibition of flaring associated gas without written permission of the Ministry of Petroleum Resources. The major difference was that it turned the decrees into Act of parliament. In 2005, the oil companies paid a paltry \$19.8 million as penalty for gas flaring yet they prefer to flare gas and pay the scanty fines at huge environmental costs to oil bearing communities that are most affected by the impacts. Thus, the oil companies would rather pay than make the investments needed to stop indiscriminate gas flaring. Owing to this, the gas flare penalty was increased to \$3.50 in 2008 for every 1000 standard cubic feet of associated gas flared. In January 2010, the House of Representatives fixed December 31, 2012 as the terminal date of gas flaring in Nigeria in the bill awaiting enactment (Ibikunle, 2006; Malumfashi, 2007; Aghalino, 2009; Oluduro, 2011; Ukala, 2011).

Currently, two important bills are at the National Assembly, namely, 2008 Associated Gas Re-injection (Amendment) Bill and 2009 Gas Flaring (Prohibition and Punishment) Bill. The 2008 Associated Gas Re-injection (Amendment) Bill seeks to extend the deadline for flaring of associated gas to December 31, 2008 and to impose a fine of 410 Naira (about \$3.00) per standard cubic feet of gas flared. While the 2009 Gas Flaring (Prohibition and Punishment) Bill seeks to prohibit or forbid flaring of both associated and non-associated gas and makes the penalty equal to what is applicable in the international market, and applicable fine shall not be regarded as part of joint ventures (JVs) obligations. Under this proposed law, oil companies are required to report all emergency gas flaring within 24 hours of occurrence, failure of which will attract fine of US \$500,000. The Bill further provides that any company that declares an incorrect volume of flared gas shall be liable to a fine of US \$100,000 and must pay the difference of such wrongly declared volumes at the prevailing international gas market rate (Oluduro, 2011). This is because of the tendency for oil multinationals to falsify or under report gas flare volume due to lack of metering and monitoring in order to underpay gas flaring fines or penalty.

According to the Section 3 (1) of the 2009 Gas flaring (Prohibition and Punishment) Bill: "No Company engaged in the production of oil and gas shall after December 31, 2012 flare gas produced in association with oil, other than such minimum allowed by the Minister by regulation". Section 3 (2) (b) of the Bill permits the Minister to grant a temporary gas flaring permit to any company which seeks to continue to flare gas in particular field (s) on payment of the sum of \$5.00 per 1000 standard cubic feet of gas flared with a processing fee of \$1000. A temporary gas penalty is payable for any gas flared in excess of approved gas volumes during pre-commissioning and commissioning operations, equipment, maintenance and operation upset.

But under the JV arrangements, the gas flare penalty being levied by government is more or less tantamount to government or NNPC paying itself, which becomes an incentive rather than disincentive for flaring. It is like giving with one hand and taking with the other hand leaving nothing to the oil communities whose environment is being devastated. There is as well allegation or accusation of under reporting of gas flare volumes and under payment of a gas flare penalty by oil multinationals and even allegation of inaccurate gas flaring data in Nigeria. This is demonstrated by irregularities in gas flare penalty payment as audited by NEITI.

More importantly, the gas flare fine is still too low to deter oil multinationals operated JVs from gas flaring. Even the approximately \$3 million per month of fines that the Nigerian government receives is just a fraction of what it could impose. The reasons fines are not increased is that Nigerian government owes a big debt to oil multinationals operating JVs as part of its cash calls obligations or share of its participation interest in JVs. The government cannot actually collect most of the fines for gas flaring since it has failed to redeem its own

obligation. Thus, oil multinationals complain that budget constraint and consequent delays to schedule are putting pressure on the flare down and out programmes (Okubote, 2001; Ishisone, 2004).

3.2. Nigerian Government and Provision of Incentives for Gas Flaring Reduction and Elimination

In realizing that penalties and fines alone cannot deter oil firms from flaring associated gas, the Nigerian government introduced a number of legal and economic incentives to encourage oil companies to improve upon utilization of associated gas rather than flaring it. Some of these gas incentives are covered under the following Agreements and Acts, namely; Associated Gas Framework Agreement (AGFA) 1992; Financial (Miscellaneous Taxation Provision) Act 1998; Financial (Miscellaneous Taxation Provision) Act 1999; and Nigerian Liquefied Natural Gas (NLNG) Act 1990 (Ibikunle, 2006).

The Associated Gas Framework Agreement (AGFA) was introduced in 1991/1992 as a fiscal incentive for natural gas utilization. AGFA involved broad-based packages such as processing, production, transmission and supply of gas to the NLNG. The Fiscal Incentive Guarantee and Assurance Decree (FIGAD) 30 of 1990 was meant to hasten or quicken the development of the NLNG project. It exempts oil and gas companies involved in the NLNG project from import duties and export charges and as well grants them tax holidays (Bankole, 2001; Aghalino, 2009).

The Associated Gas Utilization Fiscal Incentives (AGUFI) was introduced as economic incentives for investments in gas-to-liquid projects and for oil firms dedicated to enhancing utilization of gas resources. For example, in January 1998, the Nigerian government decides to cut income taxes for gas projects from 85 percent to 35 percent. Gas projects would henceforth be treated under usual company income tax rates instead of the higher tax rates applicable to income from oil production. For integrated oil and gas projects, oil operation is to be separated from gas operation (Christiansen and Haugland, 2001).

The Nigerian Liquefied Natural Gas (NLNG) Act 1990 provided incentives covering projects such as LNG, GTL, IPPs, etc. The NLNG Act of 1990 provides for tax free period of 3 to 5 years or 10 years specifically for NLNG and as well allows for the quick recovery of investment. While the Financial (Miscellaneous Taxation Provision) Acts of 1998 and 1999 provides for reduction in tax rate and investment tax credit/allowance. Other fiscal incentives include a value-added tax (VAT) and customs-duty exemption on plant machinery and equipment; import duty reduction on construction materials; a five-year tax holiday; an accelerated tax capital allowance after the tax free period in the form of 90% with 10% retention on the books for investments in plant and machinery; guarantee export earnings to cover offshore obligations; a 15 percent investment capital allowance that shall not reduce the value of the asset; hundred percent ownership or equity holding; tax-free dividends during the tax-free period; and tax-deductible interest on loans for associated gas utilization projects (Okopido, 2002; Ibikunle, 2006; Buzcu-Guven, Hariss and Hertzmark, 2010).

Recently, Nigerian government has constituted a technical committee on the implementation of the downstream natural gas sector reform meant to stimulate investment in utilization of associated gas. The term of reference of the Committee is to work out details and run checks on the Natural Gas Draft Bill (NGDB) which is currently under deliberation in the National Assembly. The Committee will also include critical examination of the sections of the bill that relate to taxes and fiscal terms, and advise government on the best options for the industry to be fast tracked. Other legislations in the process include the Downstream Gas Act (DGA) which would be aimed at liberalization of the gas sector with a view to ensuring a level playground for investment. It has already been received by Federal Executive Council (FEC) and has been forwarded to the National Assembly for consideration (Malumfashi, 2007).

In addition to legal and fiscal incentives, the Nigerian government has established some institutions to stimulate and coordinate gas development in the country. Some of these institutions include Nigerian Gas Company as a subsidiary of the NNPC with responsibility for gas gathering and transmission in the country. There is also a gas division in NNPC with responsibility for coordinating gas investment and management arrangements (Etete, 1995; Aghalino, 2009).

More recently, the Nigerian government has produced a Gas Master Plan in 2007 that is aimed largely at promoting or encouraging domestic use of natural gas for cooking and power sector as a means to end flaring. It also aims to complement power sector reform with increased domestic gas prices to create improved incentives to natural gas producers. It is believed that this Plan will double domestic gas utilization. The Plan also aims at better utilization of existing gas transmission capacity by the international oil companies (IOCs) operating in Nigeria. The Gas Sector Plan is as well aimed at creating a more secure and viable transactional environment for gas sales to domestic buyers and users (Buzcu-Guven, Hariss and Hertzmark, 2010). Nigerian government has through Gas Master Plan formulated gas pricing policy, domestic gas supply obligation and gas infrastructure blueprint or gas supply and distribution national grid (Ukpohor, 2011).

The aspirations of the Nigerian government in the Gas Master Plan are; one, to enhance the development of the domestic gas market and facilitate the growth of the power and industrial sectors; provide an enabling environment for the entry of new investors and increased private sector participation in gas sector,

address environmental issues and end gas flaring; capture economic value of gas through domestic and export projects; generate as much revenue from gas as oil within the decade; and diversify from an oil industry to an integrated oil and gas industry (Ibikunle, 2006; Okopido, 2007).

Earlier in 1999/2000, the Nigerian government initiated a study which identified the following options to fast track gas development such as concentrating on gas export drive mainly LNG in view of its growing international demands; stimulates domestic demand through the development of power sector and reviewing dormant gas utilization centres or projects like steel plants, cement plants, aluminum plants, power plants and fertilizer plants. Nigerian government is also trying to revive the Liquefied Petroleum Gas (LPG) market and make them available and affordable as a step towards discouraging the use of firewood necessary for slowing down the process of desertification (Ibikunle, 2006; Okopido, 2007).

In order to cope with the anticipated increase in domestic gas requirements due to expansion in existing gas infrastructure, the Nigerian government is constructing another pipeline extension from Ajaokuta to Obajana Cement Factory and new set of pipelines for the new power plants. Still under the Nigerian Gas Master Plan, government is encouraging the manufacturing sector to switch over from less efficient fuels such as LPFO and diesel to cleaner, more efficient and cheaper natural gas. The Nigerian government is also looking at the use of Compressed Natural Gas (CNG) for automobiles as an alternative to the use of diesel and petrol. In order to achieve this, government has slated existing and proposed gas distribution zones under franchise with Nigeria Gas Company (NGC) such as Agbara industrial Area to Shell Nigeria Gas (SNG); Greater Lagos Area to Gaslink Nigeria Limited; Ikorodu Industrial Area to Falcon Nigeria Limited, and Epe-Lekki Area to Gasland Nigeria Limited (Ibikunle, 2006; Okopido, 2007).

Gaslink, which supplies natural gas to nearly thirty industrial customers in Ikeja Industrial District, Lagos, planned to include 150 industrial customers, 250,000 residential/commercial customers and 25 independent power producers. Other Several distribution schemes are being proposed by the Nigerian government to help promote domestic consumption of gas in Nigeria such as the proposed \$580 million Ajaokuta-Abuja-Kaduna Pipeline to supply natural gas to Central and Northern Nigeria (Aghalino, 2009).

Nigerian government also rolled out a catalogue of very robust and attractive investment opportunities in the gas sector like gas gathering transmission and distribution; utilization of gas as fuel for industries and power generation; distribution of gas as domestic fuel; natural gas vehicles filling plants and conversion kits; production of LPG, etc; gas to liquid plants; manufacturing of gas-fired appliances, pipes and vessels; and building new LNG plants for gas export (Okopido, 2007). However, despite these efforts, aspirations and projections, Nigeria was not able to meet these targets and projections in growing gas demand, stimulating gas sector investments, among others (see Appendix IV). Consequently, the various zero-gas flaring deadlines were not achieved.

3.3. Economic Versus Environmental Diplomacy and the Role of the Nigerian Government in the International Initiatives for Gas Flaring and Climate Change Mitigation

Nigerian government has been involved in numerous international engagements, agreements and initiatives for mitigation of gas flaring, carbon emissions, global warming, and climate change. Some of these international initiatives for gas flaring and climate mitigation include the United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; World Bank Carbon Credit Finance; Global Gas Flaring Reduction Partnership (GGFRP); Convention on Biological Diversity; the Ramsar Convention; the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and various bilateral and multilateral agreements with other countries (Christiansen and Haugland, 2001; Aghalino, 2009; Buzcu-Guven, Harriss and Hertzmark, 2010; Oluduro, 2011).

Nigeria is signatory to the Convention in Biological Diversity (CBD) of 1992, the Ramsar Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973). Nigeria signed the United Nations Framework Convention on Climate Change (UNFCCC) of 1992. Nigeria also ratified the 1997 Kyoto Protocol aims at strengthening the international response to climate change and promoting the ultimate objective of UNFCCC. Consequent upon this ratification, Nigeria as a non-Annex I country, is eligible to host Clean Development Mechanism (CDM) projects that can earn it revenue from the sale of carbon credits. The Federal Ministry of Environment (FME) is one of the relevant authorities for CDM in Nigeria, mainly involved in the broader policy at national level (ICF International, 2006).

Recently, the Nigerian government introduced another authority or body called the Presidential Implementation Committee on CDM (PIC CDM) as the body to organize CDM activities in Nigeria. Also, the PIC CDM has been named the Designated National Authority (DNA) as required by the UNFCCC and as defined in the Marrakech Accords. In this capacity, the PIC CDM has complete responsibility for CDM activities, especially in areas where government intervention and activities are expected. Thus, the DNA is expected among other things to promote CDM projects in Nigeria; provide clear and flexible procedures for review and approval of CDM projects; provide documentation and communication portals that give clear information to project

proponents and investors (both buyers of Certified Emission Reduction CERs and/or financials of the project) on the necessary steps or procedures to have an approved CDM project in Nigeria; provide clear guidance on national sustainability criteria that should be taken into consideration in developing CDM projects; write Letters of Approval (LoA) for projects being sent to Executive Board for review and other CDM project cycle activities, after the DNA must have carried out some reviews of the proposed CDM project; and keep a registry of CDM projects in the pipeline in Nigeria (ICF International, 2006).

In the case of green financing, Nigeria engages with the Global Environmental Facility (GEF) for funding of gas sector and energy projects. The GEF is the interim mechanism of the UNFCCC. Although Nigeria is eligible for GEF funds, it must compete not only with other developing countries but with projects in other core areas. In March 1998, US\$2.75 billion was committed to the replenishment of the GEF as a whole. Yet from 1991 to 1998, climate change projects accounted for only 38 percent of all GEF projects. It is noteworthy to state here that GEF funding can only be used for the incremental cost of changes to existing projects or planned (baseline) activities in order to make the revised activities benefit the global environment (Christiansen and Haugland, 2001).

In this case, only the incremental cost involved in carrying out or planning a project in order to make it reduce GHG emissions would receive the funding. Thus, GEF is unlikely to play any noticeable role for the market penetration of associated gas in Nigeria. The only large GEF project related to gas flaring was considered in the mid-1990s which passed all the GEF criteria for approval. The GEF grant approved precisely in 1995 to the Escravos Gas project for US\$ 20 million was meant to make up for revenue losses the Nigerian government would suffer as a consequence of tax breaks being offered to the project investors, but was later withdrawn (Christiansen and Haugland, 2001). For information on GEF grants to Nigeria see Table 2 below.

However, none of these projects in the above table, partly or fully, financed by GEF in Nigeria is directly related to gas flaring mitigation though related to climate change mitigation except the Nigeria National Energy Development Project that is indirectly related to associated gas flaring reduction.

Nigerian government is also involved in the bilateral and multilateral international engagement with other countries to facilitate gas flaring reduction through market access for gas distribution. For example, on August 11, 1999, the Nigerian government engaged the government of the Benin Republic and Ghana in a Memorandum of Understanding (MOU) signed with a consortium of companies consisting of Chevron, Ghana National Petroleum Corporation (GNPC), the Nigeria National Petroleum Corporation (NNPC), SPDC, Solbagaz and Sotgaz for the development of West Africa Gas Project under the Joint Development Zone (JDZ) in which Nigerian government lent Ghana and Sao Tome and Principe a certain sum of money in 2006. Another effort at regional cooperation is the one in which Nigeria engaged Algeria is the Trans-Saharan Gas Pipeline being proposed to convey natural gas from Nigeria to Europe through Algeria. Also, Nigeria engaged Equatorial Guinea in a proposed gas pipeline to supply 600 mmscf per day of gas by 2009. These proposed gas pipelines projects are yet to see the light of the day (Ibikunle, 2006; Aghalino, 2009).

As such on August 11, 1999, a Memorandum of Understanding (MOU) spearheaded by Nigerian government was signed by participating countries, namely, Nigeria, Ghana, Togo and Benin. In February 2000, an Inter-Governmental Agreement was signed by governments of these countries. The West African Gas pipeline will transport natural gas from the Lagos terminal in Nigeria to three delivery points in Cotonou (Benin), Lome (Togo) and Tema (Ghana) over a distance of 681 km. The pipeline construction and operations obtained financial guarantees of the World Bank. The total project cost around \$974 million of which the World Bank guarantee for Ghana was \$80 million while the Multilateral Investment Guarantee Agency (MIGA) provided a \$75 million political risk guarantee for WAGPCo (Ukpohor, 2011).

Nigerian government is also engaging World Bank in its efforts to reduce and eliminate gas flaring. World Bank happens to be managing over \$1 billion funds for carbon purchase. Subsequently, in June 28, 2005, the World Bank approved a credit for the National Energy Development Project in Nigeria. The project facilitates preparatory work required to launch the main domestic transmission gas pipeline from the South to the North of Nigeria and related gas-to-power generator projects. Since then, World Bank has been assisting Nigeria directly and indirectly in gas flaring reduction. Apart from carbon financing, the World Bank assisted Nigeria in drafting its National Gas Master Plan and Natural Gas Strategy Study, Downstream Gas Bill and Fiscal Regime for Gas Bill (Ibikunle, 2006). For information on World Bank carbon financing to Nigeria see Table 3 below.

Nigeria is one of the partners of the Global Gas Flaring Reduction Partnership (GGFRP) set up in 2002 following the collaboration of Norwegian government and World Bank at a conference titled World Summit on Sustainable Development in Johannesburg, South Africa. Nigerian government has been collaborating with the GGFR in its efforts to achieve gas flare out. These collaborations are in the areas of domestic gas sector policy; integration of operator plans; gas to power sector reform and implementation of the gas to power franchise model; financing of common infrastructure projects; small scale gas utilization; and use of CDM to obtain carbon credits for flare reduction projects. The GGFR has been involved in the preparation of Nigeria Gas Master Plan and Energy Sector Reform which include economic and financial viability of the gas pipelines.

GGFR is also assisting Nigeria in carrying out gas pipeline engineering study and support to the implementation of the legal and regulatory framework for the gas sector and energy pricing study (World Bank, 2011).

As part of the larger effort to assist Nigeria in its efforts to reduce gas flaring and venting, the GGFR hosted a workshop in Nigeria, first of a series. The key aim of the workshop was to support the designing of financial mechanisms for gas flaring reduction projects including assisting Nigeria in obtaining carbon credit financing. The workshop helped build CDM capacity among project developers and national authorities leading to a viable pilot project. Already two projects benefited from CDM through GGFR partnership. For example, Kwale-Okpai IPP utilizes associated gas from five fields for power generation with a capacity of 480 megawatts using 140 mmscf/d, while Afam IPP with a capacity of 650 MW utilizes 190 mmscf/day. Another project that may be considered is Obiafu-Obrikom Gas injection project involving the reinjection of between 270-350 mmscf/d with a potential to delay the release of the equivalence of 2.46 million tons of CO₂/year to the atmosphere (Ibikunle, 2006). For information on GGFR's flaring reduction demonstration projects from carbon finance in Nigeria, see Table 4 below.

Nigeria is one of the GGFR partners that has endorsed a voluntary standard to eliminate venting and reduce flaring significantly within five to ten years by finding commercial uses for the associated gas through increased collaboration between countries. The Standard's initial goal for flaring and venting is "no continuous flaring and venting of associated gas, unless there are no feasible alternatives". Today, the Nigerian government is implementing the GGFR's voluntary standard for reducing global gas flaring and venting with the goal of reducing barriers to the utilization of associated gas through markets and infrastructure, commercialization of associated gas, strengthening of regulations, and trading of carbon credits (Buscu-Guven, Harriss and Hartzmark, 2010).

The voluntary standard recommends consistent use of mass and energy balances to estimate gas flare and vent volumes in the existing wells, and the installation of flow metres in newly developed wells and in existing facilities with large flare volumes. The GGFR also recommends continuous metering of the gas volume flared at the source or flare gas burners and the measurement of associated gas composition and heating values essential to determining green gas emission rates (Buscu-Guven, Harriss and Hartzmark, 2010).

3.4. Nigerian Government, Rentierism and Zero-Gas Flaring Deadlines

Nigerian government has been setting gas flare out deadlines, but to no avail. The first attempt by Nigerian government to impose gas flare out regime was in the 1979 Associated Gas Reinjection Decree No. 99 which mandated oil companies to stop gas flaring in 1984, or face fines, or forfeits acreage for violation. But oil majors in Nigeria indicated difficulties in meeting the 1984 deadline citing lack of finance to construct a gas re-injection plant within the timeframe. As a result the deadline was extended to 1985, yet oil companies failed to adhere to the provisions claiming it was too expensive to re-inject gas. More importantly, the 1979 Associated Gas Reinjection Decree No. 99 backing the 1984 and 1985 deadlines for gas flaring was flawed by its provision of certificate of permission from the Federal Ministry of Environment to exempt oil fields for a fee (Ibikunle, 2006; Malumfashi, 2007; Aghalino, 2009; Oluduro, 2011; Ukala, 2011).

In 1999, on the return of Nigerian government to civilian administration, it announced that all oil firms should end gas flaring by 2003 which was later extended to 2004. In response to this, oil multinationals rejected the 2004 zero-gas flaring deadline as unrealistic and blamed government for not consulting them in setting the deadline. On its part, Shell announced that it would eliminate gas flaring from its oil fields in 2008. Again, the Nigerian government was persuaded and dropped the 2004 deadline for 2008 deadline recommended by oil multinationals. Once again, the 2008 deadline reached with the understanding with oil companies, was not backed by any new legislation or formal regulation. Not being legally binding the deadline was made vulnerable to violation (Social Development Integrated Centre, 2009).

Not surprisingly, in 2005, Shell announced to members of the Nigerian Senate that the 2008 deadline is no longer realistic as it now set its target for 2009. By 2008, Nigerian government was a bundle of contradiction as the President and members of the Federal Executive Council (FEC) could not agree on whether the deadline was for January or December of the same year (Social Development Integrated centre, 2009). Since then the Nigerian government has been shifting zero-gas flaring deadlines, for examples, from 2009 to 2011 and from 2011 to 2012, and thus, gas flaring continues in Nigeria.

In spite of all these efforts by Nigerian government, oil multinationals in joint ventures with NNPC continue to flare gas in oil fields, and there is nothing on the ground to suggest that they will end gas flaring soon. In other words, the oil multinationals are still flaring associated gas in Nigeria and have consistently failed to comply with the zero-gas flaring deadline in Nigeria leading to perpetual shift in zero-gas flaring deadlines from 2003 to 2004 to 2008 to 2009 to 2011 to 2012. The consequence is that zero-gas flaring in Nigeria has remained elusive as the government has

been setting new deadlines every year to completely stop flaring. However, the government has not been successful in enforcing these deadlines on oil multinationals. The point is that the Nigerian government has

not been completely committed and sincere in ensuring compliance by oil multinationals for fear of losing oil revenues. A serious government would have pegged oil production to the capacity of gas utilization even if it means reduction in oil production and loss of revenues. Thus, Aghalino (2009) states that it is puzzling that in spite of the measures that have been taken by the Nigerian government to stop gas flaring, oil firms continue to flare gas in its various oil fields in Nigeria. For details, see Table 5 below.

Perhaps, this lies in the rentier character of the Nigerian state or the rentier economy of the Nigerian economy in which oil is the mainstay of the Nigerian economy resulting in prioritization of economic diplomacy over environmental diplomacy. There is over dependence or reliance on oil revenue due to non-diversification of the Nigerian economy which makes it difficult for Nigerian government to risk revenue loss that may result from rigid and radical gas flaring elimination measures. The point is that the place of oil in Nigerian economy makes it impossible for government to limit oil production to gas utilization capacity.

4. Conclusion

Oil as we noted remains the mainstay of Nigerian economy since 1970, fourteen years after its discovery in commercial quantity and twelve years after production. Indeed, the Nigerian crude oil is mixed with natural gas, and flaring of associated gas (AG) began with crude oil production. In other words, gas flaring is as old as crude oil production in Nigeria. The point is that gas flared in association with crude oil production began in Nigeria under the British Colonial Rule when Shell began oil production in 1958, and with increasing production of oil, the volume of gas flared in the process of oil production increased.

Apart from economic and energy waste incurred from gas flaring, it has negative impacts on the environment and health. This is because flaring of associated gas emits a greenhouse gas (GHG) which contributes to global warming and climate change. Although the environmental effects of gas flaring is transboundary or global in terms of global warming and climate change, it has some negative effects on the immediate and local environment with serious health, agricultural and even economic implications.

We noted that in spite of all these efforts by Nigerian government, oil multinationals in joint ventures with NNPC continues to flare gas in oil fields, and there is nothing on the ground to suggest that they will end gas flaring soon. For example, Table 1 above shows that Nigerian government has been able to reduce gas flaring in relative terms but not in absolute terms. Also, Appendix V below indicates that Nigeria still rank second in the gas flaring globally. In other words, the government has been setting new deadlines every year to completely stop flaring to no avail. Due to rentier character of the Nigerian state, rentier mentality of the Nigerian rentier (ruling) class and rentierism of the Nigerian economy, the government has not been successful in enforcing these deadlines on oil multinationals. This is largely because the Nigerian government has not been completely committed and sincere in ensuring compliance by oil multinationals for fear of losing oil revenues, a case of failure of environmental diplomacy. Indeed there is a tension between economic diplomacy and environmental diplomacy. A serious government would have pegged oil production to the capacity of gas utilization even if it means reduction in oil production and loss of revenues. Thus, Aghalino (2009) states that it is puzzling that in spite of the measures that have been taken by the Nigerian government to stop gas flaring, oil firms continue to flare gas in its various oil fields in Nigeria.

Given the rentier character of the Nigerian state, the fundamental thing to do is to diversify the revenue base of the economy to reduce the excessive dependence on oil revenue by mainstreaming other domestic sources of revenue like direct tax as well as developing other sectors of the economy like manufacturing sector. This is a fundamental and far reaching solution to increasing the ability or political and economic will of enforcing zero-gas flaring regime in Nigeria.

References

- Agboola, M.O., Nwulu, N.I., Egelioglu, F. and Agboola, O.P. (2011) "Gas Flaring in Nigeria: Opportunity for Household Cooking Utilization" *International Journal of Thermal and Environment Engineering* 2 (2): 69-74.
- Aghalino, S.O. (2009) "Gas Flaring, Environmental Pollution and Abatement Measures in Nigeria, 1969-2001", *Journal of Sustainable Development in Africa* 11 (4): 219-238.
- Ainablonson Newsletter, April 2011.
- Bankole, A.S. (2001) *Incentives and Regulations to Abate Gas Flaring in Nigeria: Towards an Optimal Gas Utilization Policy*, Ibadan: NES.
- Beblawi, H. (1990) "Rentier State in the Arab World" in G. Luciani (ed.) *The Arab State*, London: Routledge.
- Beblawi, H. and Luciani, G. (1987) *The Rentier State*, London: Croom Helm.
- Buzcu-Guven, B., Harriss, R. and Hertzmark, D. (2010) "Gas Flaring and Venting: Extent, Impacts and Remedies" in J. Barnes, et al (eds.) *Energy Market Consequences of an Emerging US Carbon Management Policy*, *Energy Forum*, Houston: James A. Baker III Institute for Public Policy, Rice University.

- Centre for Energy Economics (CEE) (nd) Gas Monetization in Nigeria.
- Christiansen, A.C. and Haugland, T. (2001) "Gas Flaring and Global Public Goods", *the Fridtjof Nansen Institute (FNI) Report 20*.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Etete, D. (1995) *Investment Prospect in the Petroleum Sector*, Ibadan: Spectrum.
- Feldman, N. (2003) *After Jihad: American and Struggle for Islamic Democracy*, New York: Farrar, Straus and Giroux.
- Global Gas Flaring Reduction (GGFR) *Brief*, 2004.
- Global Gas Flaring Reduction Public-Private Partnership Expanded Update November 2005.
- GGFR-CFFS Committee Workshop on "Mitigating the Growing Contributions in Global Emissions" *Dead Sea*, April 25, 2007.
- Herb, M. (2002) "Does Rentierism Prevent Democracy" A Paper Delivered at the 2002 Annual Meeting of the American Political Science Association, August 29 - September 1.
- Ibeanu, O. (2008) "Affluence and Affliction: The Niger-Delta as a Critique of Political Science in Nigeria" Being a 27th Inaugural Lecture of the University of Nigeria, Nsukka Delivered on February 20, Nsukka: University of Nigeria Press.
- Ibikunle, A. (2006) "Reducing Greenhouse Gas Emission: The Nigerian Approach" A Paper Delivered at OPEC-EU CDM Conference on September.
- Ifesinachi, K. (2007) "The Rentier State, Global Liberalism and Citizenship in Nigeria" A Paper Presented at the International Conference on *Globalization: Migration, Citizenship and Identity*, University of Ibadan, Nigeria, November 6-9.
- Inner City Fund (ICF) International, "Nigeria: Carbon Credit Development for Flare Reduction" *Projects Guidebook*, June 2006.
- International Petroleum Industry Environmental Conservation Association (IPIECA), October 2009.
- Ishinone, M. (2004) "Gas Flaring in the Niger Delta: The Potential Benefits to its Reduction on the Local Economy and Environment" Retrieved from <http://nature.berkeley.edu/classes> on 21/09/2012.
- Kaldany, R. (2006) "Global Gas Flaring Reduction: A Time for Action!" A Keynote Speech Presented at *Global Forum on Flaring and Gas Utilization*, Held in Paris on December 13.
- Khouri, R. (2008) "Rentierism Revisited" *Arab Reform Bulletin*, September.
- Kingston, K.G. (2011) "The Dilemmas of Minerals Dependent Economy: The Case of Foreign Direct Investment and Pollution in Nigeria", *African Journal of Social Sciences* 1 (1): 1-14.
- Luciani, G. (1990) "Allocation Vs. Production States: A Theoretical Framework" in G. Luciani (ed.) *The Arab State*, London: Routledge.
- Mahdavy, H. (1970) "The Patterns and Problems of Economic Development in Rentier States: The Case of Iran" in M.A. Cook (ed.) *Studies in Economic History of Middle East*, London: Oxford University Press.
- Malumfashi, G.I. (2007) "Phase-out of Gas Flaring in Nigeria by 2008: The Prospects of a Multi-win Project", *Petroleum Training Journal (PTJ)* 4 (1): 1-39.
- Moore, M. (2004) "Revenues, State Formation and the Quality of Government in Developing Countries" *International Political Science Review*, 25 (3).
- National Oceanic and Atmospheric Administration (NOAA) *Satellite Data*, 2012.
- Nigeria Delta Environmental Survey (NDES), *Socio-Economic Characteristics* Volume 11996.
- Nigerian National Petroleum Corporation (NNPC), *Annual Statistical Bulletin*, 2010.
- Nigerian National Petroleum Corporation (NNPC), *Annual Statistical Bulletin*, 2011.
- Nwankwo, C.N. and Ogagarue, D.O. (2011) "Effects of Gas Flaring on Surface and Ground Waters in Delta State Nigeria" *Journal of Geology and Mining Research* 3 (5): 131-136.
- Ogbara, N. (2009) "Why the Extant Legal Framework Prohibiting Gas Flare in Nigeria did not Work?" A Paper Presented at a Social Action Organized Forum on *Gas Flaring Prohibition and Sustainable Energy Future for Nigeria* on September 30 at Bolton White Hotels Ltd, Abuja.
- Okopido, I.T.O. (2002) "Global Gas Flaring Reduction Initiative: The Way Forward and Nigeria's Next Steps" A Paper Presented at the High Level Conference on *Global Gas Flaring Reduction Initiative* Organized by the World Bank in Conjunction with the Government of Norway in Oslo on April 15-16.
- Okubote, J.T. (2001) "Repositioning the Oil and Gas Industry for Economic Development", CPDD, NNPC May.
- Oluduro, O. (2011) "Bureaucratic Rhetoric of Climate Change in Nigeria: International Aspiration Versus Local Realities", retrieved from <http://www.iucnael.org/en/documents> on 11/02/2012.
- Schwarz, R. (2007) "Rentier States and International Relations Theory" A Paper Presented at the 6th Pan European Conference.
- Smith, B. (2004) "Oil Wealth and Regime Survival in the Developing World: 1960-1999" *American Journal of Political Science*, 48 (2).
- Social Development Integrated Centre (Social Action) (2009) *Flames of Hell: Gas Flaring in the Niger Delta*.

- Ukala, E. (2011) “Gas Flaring in Nigeria’s Niger Delta: Failed Promises and Reviving Community Voices”, *Journal of Energy, Climate and Environment* 97: 97-126.
- Ukpohor, E.T.O. (2010) “Nigeria Gas Master Plan: Strengthening the Nigeria Gas Infrastructure Blueprint as a Base for Expanding Regional Gas Market”, *World Gas Conference Technical Paper*.
 World Bank *Statistical Information*, 2004.
 World Bank (2004) *A Voluntary Standard for Global Gas Flaring and Venting Reduction*, No. 4.

Table 1: Total Gas Produced and Flared (mcsf) 2001-2011

Year	Gas Produced	Gas Flared	Percentage Gas Flared
2001	1,822,922,111	920,905,671	50.52
2002	1,651,591,488	744,108,036	45.65
2003	1,830,302,769	847,614,682	46.31
2004	2,082,283,189	886,070,555	42.55
2005	2,093,628,859	812,332,777	38.80
2006	2,182,432,084	799,998,369	36.66
2007	2,140,274,706	659,368,435	30.81
2008	2,282,440,395	617,618,876	27.06
2009	1,837,278,307	509,351,905	27.72
2010	2,392,838,898	581,568,354	24.30
2011	2,400,402,880	619,032,858	25.79

Source: NNPC *Annual Statistical Bulletin* 2010 and 2011.

Table 2: Global Environmental Facility (GEF) to Nigeria

Date	GEF Grants in US\$ Million	Project
August 1, 2003	8	To complement LEEMP in financing biodiversity management and ecosystem service
August 22, 2005	1	Nigerian National Energy Development Project GEF Medium Size Programme (MSP)
August 11, 2006	10	Second National Fadama Development Critical Ecosystem Management Project
June 29, 2010	4.5	Lagos Urban Transport Project II
July 08, 2010	6.8	Nigeria Scaling Up Sustainable Land Management Practice, Knowledge and Coordination

Source: World Bank Statistics, 2011.

Table 3: World Bank Credit Facilities to Nigeria

Date	Project Name	Credit Facilities in \$
June 28, 2005	National Energy Development Project (NEDP)	172
August 06, 2007	National Energy Development Project (Carbon Offset)	5.87
June 09, 2008	NG-Lagos Landfill Gas and Composing (FYO6)	2.13
June 16, 2009	Nigeria Electricity and Gas Improvement Project (NEGIP)	200

Source: World Bank Statistics, 2011.

Table 4: GGFR’s Flaring Reduction Demonstration Project from Carbon Finance in Nigeria

Company	Project	Project Type	CER/EUR y (k)	CER/EUR 2012 (k)	Status	Method
Eni	Kwale	Gas-to-Power	1,513	10,540	Registered	AM0009
Shell	Afam	Gas-to-Power	740	3,700	Method submitted	NM
Eni	ObOb	Gas to Reinjection	2,000	10,000	On hold	NM

Source: GGFR-CFFS Committee Workshop, *GGFR Brief*, April 25, 2007.

Table 5: Nigeria's Estimated Flared Volumes (in bcm) from Satellite Data, 2002-2011

Year	F14	F15	F16	F18	Average
2002	21.1	21.0	-	-	21.0
2003	23.1	24.6	-	-	23.8
2004	-	21.9	23.4	-	22.6
2005	-	20.0	22.5	-	21.3
2006	-	17.6	19.7	-	18.6
2007	-	15.5	17.0	-	16.3
2008	-	-	15.5	-	15.5
2009	-	-	14.9	-	14.9
2010	-	-	-	15.2	15.0
2011	-	-	-	-	14.6

Source: National Oceanic and Atmospheric Administration (NOAA) *Satellite Data*, 2012.

**APPENDIX I
 GAS PRODUCED AND FLARED FROM 1958 to 1994**

Year	Gas production (Mm ³)	Gas Flared (Mm ³)
1958	46	-
1959	1.40	-
1960	144	-
1961	310	-
1962	487	-
1963	626	-
1964	1,029	-
1965	2,250	-
1966	2,907	-
1967	2,634	-
1968	1,462	-
1969	4,126	-
1970	8,039	7,957
1971	12,975	12,790
1972	17,122	16,848
1973	21,882	21,487
1974	27,170	26,776
1975	18,656	18,333
1976	21,276	20,617
1977	21,924	20,952
1978	21,306	19,440
1979	27,618	26,073
1980	24,885	22,904
1981	17,202	14,162
1982	14,830	11,940
1983	15,207	11,948
1984	16,251	12,817
1985	18,426	14,846
1986	17,900	13,917
1987	15,580	12,291
1988	20,212	14,737
1989	26,300	18,730
1990	28,163	21,820
1991	31,587	25,934
1992	32,465	24,588
1993	33,445	25,406
1994	33,928	25,934

Source: Nigeria Delta Environmental Survey (NDES), *Socio-Economic Characteristics* Volume 11996 culled from Aghalino, S.O. (2009) "Gas Flaring, Environmental Pollution and Abatement Measures in Nigeria, 1969-2001", *Journal of Sustainable Development in Africa* 11 (4): 219-238.

APPENDIX II
MONETARY VALUE OF GAS PRODUCED, UTILIZED AND FLARED (₦BILLION), 1961-1998

Year	Gas Produced	Gas Utilized	Gas Flared	Gas Flare Penalty
1961	8.79	-	-	-
1962	13.78	-	-	-
1963	17.75	-	-	-
1964	29.17	-	-	-
1965	98.08	-	94.68	-
1966	100.11	7.44	9.27	-
1967	189.89	7.23	182.53	-
1968	105.40	10.89	94.51	-
1969	297.44	4.61	292.82	-
1970	587.62	8.00	573.03	-
1971	936.89	14.85	922.62	-
1972	1234.33	19.75	1214.75	-
1973	2030.31	36.80	2001.52	-
1974	2530.89	36.70	2494.18	-
1975	1737.91	30.09	1707.72	-
1976	1981.67	61.20	1920.48	-
1977	2032.07	80.79	1951.68	-
1978	1908.27	97.44	1810.84	-
1979	2556.67	178.59	3379.06	-
1980	2286.93	302.88	2878.93	-
1981	1594.08	472.13	1745.71	-
1982	1993.51	320.62	1547.42	-
1983	1415.14	420.42	1548.46	-
1984	2106.13	445.57	1660.57	2526.60
1985	2406.54	602.25	1804.29	2745.34
1986	2428.45	624.80	1803.65	2744.36
1987	2225.23	644.89	1580.34	2404.59
1988	3280.50	892.02	2387.88	296.65
1989	4070.25	1021.09	3043.01	3704.10
1990	10234.80	1950.48	7260.84	4419.13
1991	25482.60	5508.00	19974.60	4802.82
1992	25988.04	6081.48	19905.76	24230.29
1993	27280.80	6407.10	20873.70	25402.51
1994	27280.30	5483.70	21797.10	26532.52
1995	28431.00	6572.34	21858.66	26607.45
1996	57429.00	14353.20	43075.80	20217.01
1997	60183.00	16820.48	39259.08	23894.06
1998	57888.44	17636.12	40743.00	49594.51

Source: Culled from Okoh (2001) in Aghalino, S.O. (2009) "Gas Flaring, Environmental Pollution and Abatement Measures in Nigeria, 1969-2001", *Journal of Sustainable Development in Africa* 11 (4): 219-238.

**APPENDIX III
NIGERIAN NATURAL GAS AND DISPOSAL, 1961-2009 (MILLION CUBIC METRES)**

Year	Gas Produced	Gas Utilized	Gas Flared
1961	310.00	N/A	N/A
1962	486.00	N/A	N/A
1963	626.00	N/A	N/A
1964	1,029.00	N/A	N/A
1965	2,849.00	116.00	2,733.00
1966	2,908.00	216.00	2,692.00
1967	2,634.00	102.00	2,532.00
1968	1,462.00	151.00	1,311.00
1969	4,126.00	64.00	4,062.00
1970	8,068.00	111.00	7,957.00
1971	12,996.00	206.00	12,790.00
1972	17,122.00	274.00	16,848.00
1973	21,882.00	395.00	21,487.00
1974	27,170.00	394.00	26,776.00
1975	18,656.00	323.00	18,333.00
1976	21,274.00	657.00	20,617.00
1977	21,815.00	863.00	20,952.00
1978	20,486.00	1,046.00	19,440.00
1979	27,450.00	1,378.00	26,073.00
1980	24,551.00	2,337.00	22,214.00
1981	17,113.00	3,643.00	13,470.00
1982	15,382.00	3,442.00	11,940.00
1983	15,192.00	3,244.00	11,948.00
1984	16,251.00	3,438.00	12,813.00
1985	18,569.00	4,647.00	13,922.00
1986	18,738.00	4,821.00	13,917.00
1987	17,170.00	4,976.00	12,194.00
1988	20,250.00	5,510.00	14,740.00
1989	25,129.00	6,303.00	18,784.00
1990	28,430.00	6,020.00	22,410.00
1991	31,460.00	6,800.00	24,660.00
1992	32,084.00	7,508.00	24,575.00
1993	33,680.00	7,910.00	25,770.00
1994	33,680.00	6,770.00	26,910.00
1995	35,100.00	8,114.00	26,986.00
1996	35,450.00	8,860.00	26,590.00
1997	37,150.00	10,383.00	24,234.00
1998	37,039.00	13,407.00	23,632.00
1999	43,636.00	21,274.00	22,362.00
2000	42,732.00	18,477.00	24,255.00
2001	52,453.00	25,702.00	26,759.00
2002	48,192.00	23,356.87	24,835.58
2003	51,766.03	27,823.00	23,943.03
2004	58,963.61	33,881.68	25,090.91
2005	59,284.97	36,282.27	23,002.71
2006	82,063.86	53,479.47	28,584.39
2007	84,707.34	57,400.21	27,307.13
2008	80,603.61	58,792.61	21,811.00
2009	64,882.86	46,895.27	17,987.59
Total	1,375,052.74	480,898.10	824,262.75

Source: NNPC, *Annual Statistical Bulletin*, 2010.

**APPENDIX IV
 SUMMARY OF GAS PROJECTS IN NIGERIA**

Project	Type	Company	Design Capacity mmcf/d	Gas Utilized mmcf/d	Cost \$m
Oso Phase II	NGL and LPG	MPN	600	600	800
Gas-to-Liquid (G-to-L)	Synthetic fuel	ChevronTexaco	300	300	1,200
Escravos Gas Plant	NGL and LPG	ChevronTexaco	Phase I-165 Phase II-135 Phase III-400 Total – 700	700	550-1000
Belema Project	Gas Re-injection	Shell	80	80	N/A
NLNG ¹	LNG	Shell (25.6)/Elf (15)/Agip (10.4)/NNPC (49)	Train 3, 4 and 5	3000	N/A
Lagos-Ikeja Gas Lines ²	Distribution and Marketing	UNIPETROL Gas Link	20	20	35
Ota/Agbara and Aba Gas Lines	Distribution and Marketing	Shell Nigeria Gas (SNG)		N/A	35
West Africa Gas Project (WAGP)	Distribution and Marketing	ChevronTexaco, Shell, NNPC, SoToGas (Togo), GNPC (Ghana), SoBeGaz (Benin)	180 620 miles of 18 feet diameter pipeline	180	400
Escravos-Lagos Gas Pipeline ² Phase 1,2 and 3	Distribution	Nigeria Gas Company (NGC)	Phase 1-80 Phase 2&3-80 Total-160	160	N/A
TNEP Phase 1-3	Distribution, Marketing and Power	ChevronTexaco, ABB		N/A	2,500
Elf Gas Company	Gas Gathering	Elf		N/A	400
Lagos Emer-Power Purchase ²	Power Generation	AES Corporation	Supply 270MW	N/A	800
ABB-IPP	Power Generation	ABB Group	Phase 1, 2 and 3-300MW	N/A	N/A

Source: Centre for Energy Economics (CEE) (nd) Gas Monetization in Nigeria.

¹Train 1, 2, 3, 4, 5 and 6 have been completed remaining Train 7.

²Not Joint Venture (JV) Projects.

N/A-Not Available.

APPENDIX V
WORLD BANK ESTIMATED TOP TWENTY GAS FLARING COUNTRIES (10⁹ CUBIC METRE)

Rank	Country	2005	2006	2007 ¹	Approximate CO ₂ Emissions from Flaring (10 ⁶ tonnes/year) for 2006 ³
1	Russia ²	55.2	48.8	50.0	116.4
2	Nigeria ²	21.3	19.3	16.8	46.0
3	Iran ²	11.3	12.1	10.6	28.9
4	Iraq ²	7.1	7.4	7.0	17.7
5	Kazakhstan	5.8	6.0	5.3	14.3
6	Algeria ²	5.2	6.2	5.2	14.8
7	Libya	4.4	4.3	3.7	10.3
8	Angola	4.6	4.0	3.5	9.5
9	Saudi Arabia	3.0	3.3	3.4	7.9
10	Qatar ²	2.7	2.8	2.9	6.7
11	China	2.8	2.8	2.5	6.7
12	Indonesia ²	2.7	3.0	2.4	7.2
13	Kuwait	2.5	2.5	2.1	6.0
14	Venezuela	2.1	2.0	2.1	4.8
15	Uzbekistan	2.5	2.8	2.0	6.7
16	United States ²	2.0	1.9	1.9	4.5
17	Oman	2.5	2.2	1.9	5.2
18	Mexico ²	0.9	1.2	1.7	2.9
19	Malaysia	1.7	1.8	1.7	4.3
20	Gabon ²	2.2	1.9	1.6	4.3
	Total	142	136	128	325.2
	Gas Flaring Level	162	157	147	374.5

Source: <http://go.worldbank.org/G20AW2DKZ0> in International Petroleum Industry Environmental Conservation Association (IPIECA), October 2009.

¹Ranking are based on 2007 data.

²GGFR countries.

³CO₂ emissions have been estimated using API compendium default natural gas higher heating value of 1235Btu/P.E.