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The Adverse Effects of Oil and Gas Exploration in Ogoniland: A Case of Bomu, Gokana L.G.A., Rivers State, Nigeria

Dr. Charles C. Mezie-Okoye

Lecturer, Department of Centre for Conflict and Gender Studies,
University of Port Harcourt, Port-Harcourt, Nigeria

Abstract:

Oil and gas exploration in the Niger Delta have devastated the region especially Ogoniland with emphasis on Bomu community. Oil consists of liquid petroleum hydrocarbons that exist as natural resources for exploration. This can be deliberately or accidentally spilled in our environment by frustrated youth or by the activities of the oil multinational companies operating in the area. Results showed that the environmental impacts of oil spillage and gas flaring in Bomu affected plant growth, depletion of aquatic lives, and the destruction of mangrove swamps. The health implications of the inhabitants include heat radiation from gas flares, high noise levels of the burning flare stack, constant lighting from the flames and breathing in of toxic gases. This paper discusses the various impacts that gas and oil exploration have had so far on the biodiversity of Bomu community in Ogoniland and is calling on the appropriate federal government to strengthen laws relating to oil exploration to ensure that oil companies operating in the Niger Delta especially in Ogoniland to comply with proper environmental standards and international best practice.

Keywords: Oil spillage, Gas flaring, degradation, environmental impacts, oil pollution

1. Introduction

Oil and gas have been a blessing and curse to Nigeria generally and the Niger Delta in particular especially the Ogoniland. Oil was discovered in large commercial quantity by Shell BP in 1956 in Oloibiri (present day Bayelsa State) and has since then been Nigeria's cash cow. The question of whether crude oil is a curse or blessing for Nigeria has remained and will continue to be an inconclusive one.

The Ogoni people have been victims of human rights violations for many years. In 1956, four years before Nigerian Independence, Royal Dutch/Shell, in collaboration with the British government, found a commercially viable oil field on the Niger Delta and began oil production in 1958. In a 15-year period from 1976 to 1991 there were reportedly 2,976 oil spills of about 2.1 million barrels of oil in Ogoniland, accounting for about 40% of the total oil spills of the Royal Dutch/Shell Company worldwide^[1].

In a 2011 assessment of over 200 locations in Ogoniland by the United Nations Environment Programme (UNEP), they found that impacts of the 50 years of oil production in the region extended deeper than previously thought. Because of oil spills, oil flaring, and waste discharge, the alluvial soil of the Niger Delta is no longer viable for agriculture. Furthermore, in many areas that seemed to be unaffected, groundwater was found to have high levels of hydrocarbons or was contaminated with benzene, a carcinogen, at 900 levels above WHO guidelines^[2].

With the expansion of oil production, the incidence of oil spills has increased considerably in the region as well as Bomu community in Gokana, Ogoniland. It is not only oil spills that are affecting Bomu, but also gas flares. There is evidence that gas flares also occur in parts of the Niger Delta and Bomu. Bubbling has been observed in certain swamps; and this means that an unknown amount of hydrocarbons may be affecting the water.

2. Materials and Methods

The target group for this study is the entire people of Bomu community who have been directly and indirectly affected by the impact of oil spills and gas flaring. The survey was however, administered on twenty categories of people namely; youth president, youth secretary or its public relation officer (PRO), women leader, secretary of the women group or its PRO or any other member of the executive council, Community Development Council (CDC) chairman, traditional ruler, a member of the council of chiefs, two clergy, one who be an indigene and another that is a non-indigene, an elder, a housewife, a woman farmer, a fisherman, a civil servant (school teacher, trader or market woman, secondary school students, a vocational trader (welder, carpenter), and another female vocational trader who must be either a hair stylist or tailor.

A total of 25 people was surveyed using stratified sample techniques in Bomu. Each interviewee was asked before conducting the survey to declare her/his consent and made aware that their identities would not be revealed to anybody.

A set target quota of 56% (14) male, 44% (11) female was interviewed within the sample size to accurately reflect the views and opinion of the sub-groups in the target population.

In terms of age distribution of the respondents, 12% (3) of them are between the ages of 18 – 24, 16% (4) of them fall between the ages of 25 – 34, 24% (6) are age between 35 – 44 while 20% (5) of them are between the ages of 45 – 54, whereas 28% (7) of them are of the ages of 55 and above. This indicates that many of the respondents are above 55 years. In terms of level of education of the respondents, the percentage of the respondents 32% (8) completed secondary school, 8% (2) of them had no formal education, 20% (5) of them finished Primary school, while 16% attended Technical/Vocational training, and 24% (6) of them completed tertiary education.

On account of marital status of the respondents, the highest percentage of the respondents are married as indicated by 56% (14) and 32% (8) of them are single, while 12% (3) are widowed, and none was divorced or separated respectively.

2.1. Incidents of Oil Spills in Bomu

The environmental impact of oil exploration on Ogoniland has been more devastatingly far-reaching than the psychological impact. Oil spills affect water in a variety of ways. When oil is released into water, it does not blend with the water. Oil floats on the surface of salt and fresh water. Over a very short period of time, the oil spreads out into a very thin layer across the surface of the water. This layer, called a slick, expands until the oil layer is extremely thin. It then thins even more. This layer is called sheen and is usually less than 0.01 mm thick.

Bomu is suffering environmental degradation and economic decline as a result of oil spills which have covered almost all parts of Bomu creeks. While oil was first struck in commercial quantity in 1956 at Oloibiri town in the present day Bayelsa State, the second discovery of oil in commercial volume was at Bomu in 1958 – the Bomu oil field contributed major supply to the first shipment of oil from Nigeria in 1958. Bomu is an Ogoni town administratively located in Gokana Local Government Area of Rivers State. There are 96 oil wells connected to 5 flow stations in Ogoni operated by the Shell Petroleum Development Company of Nigeria (SPDC – a subsidiary of the Royal Dutch Shell).

Shell, in 1995, admitted that 75 percent of its spills in the Niger Delta of Nigeria were as a result of its old or corroded pipes. Nevertheless, it maintained that 69 percent of the oil spills in Ogoni between 1985 and 1993 were caused by sabotage. Thus, Shell denied responsibility for oil spills in Ogoniland. In addition, during its operations in Ogoniland, Shell employed less than 2 percent of the Ogoni population despite the huge profit it made from the community. Shell also argued that the Nigerian government failed to deliver basic development infrastructure and other human rights to Ogoni people, and that it therefore “*went beyond what was necessary*” by providing some benefits to the Ogoni community because of the government’s failure^{[3] and [4]}.

Field investigation conducted by CEHRD reveals that the source of the oiling is an impaired spot along the 28” Bomu-Bonny pipeline within Bodo creek. The pipeline is a Trans-Niger trunk line running from the hinterlands through Gokana, having interconnections with the Bodo manifold ashore and Bodo West flow station in the mangrove swampland of Bodo Creek, and link to bonny terminal. The local people here in Bomu in the course of this Baseline research informed us that the oil spills that have occurred in this community were as a result of equipment failure (pipe rupture) many oil pipelines in Ogoniland as well as Niger Delta are aged and have outlived their shelf span. These pipes need to be changed. Information gathered from the interviewees has that there are three oil well heads located at Koro, Boo-or and Teban. The Koro Oil Well Head located within 150 meters from people’s homes. It is also within the people’s farmland. The photo below is the same well head showing farmland around it.



Figure 1

4.644310, 7.296600 Time= 11:12 a.m. New Finima Road

Koro Oil Well Head, Bomu, Gokana LGA

For a people whose livelihood revolves around fishing and farming, the effect of the near total destruction of their ecosystem by oil has taken things to a whole different level: it is now a fight for survival. With rivers clogged with oil.

sources of drinking water poisoned with hydrocarbons, farms ravaged by hydrocarbons and rains almost turning acidic from the non-stop gas flaring in the area, a generation of unhealthy people abound. As the Ogoni embers seems to be gradually dying out, and as we hope that somehow, something rekindles that fire, Nnimmo Bassey best describes the curse of oil on the Ogoni people with his poem 'We thought it was oil, but it was blood'.



Figure 2
4.510369, 7.217026 Time= 11:36 a.m. Teban Oil Well (Petroleum)

You can see that the farmlands have been devastated and the yield from the crops in these farmlands cannot do much and the people are worst for it. The people of Bomu are predominantly fishes and crops farmers and with this degradation, their means of livelihood have been destroyed to say the least. The photo above shows the petroleum Well heads located at farmlands at Teban. The photo above shows a woman farmer planting something and you could see that the crops there are stunted in growth. The woman was asked why she was still farming there when you knew that these crops will not do well and she answered that she has no other place to farm. These goes with other farmers like her. It is not only the farmlands that are affected, mangrove swamps are also affected.

The mangrove is also affected and this is not good for the fisher men and women. The Ogoni can no longer farm successfully. Once the food basket of the eastern Niger Delta, the Ogoni now buy food (when they can afford it); Fish, once a common source of protein, is now rare. Owing to the constant and continual pollution of our streams and creeks, fish can only be caught in deeper and offshore waters for which the Ogoni are not equipped. All wildlife is dead. The ecology is changing fast. The mangrove tree, the aerial roots of which normally provide a natural and welcome habitat for many a sea food - crabs, periwinkles, mudskippers, cockles, mussels, shrimps and all - is now being gradually replaced by unknown and otherwise useless types of fishes.



Figure 3: Mangrove Swamp along Lewe- Nweol Road, Bomu, Gokana LGA

Mangroves and other resources deliverable from the seascape are to the people what taxes are to the governments. Mangroves provide the people with several goods and ecosystem services. The high caloric fuel woods from mangroves support the domestic energy needs of the people. Naturally, mangroves are productive ecosystems and host extra-ordinary biodiversity; most commercial fish stocks live their larval stages in the mangrove. Given the overwhelming

dependency of Gokana people's livelihood on mangrove and artisanal fisheries, it is safe to infer that the spillage will largely undermine food security in the locality (CEHRD). Apart from the oil spills of the 1970 in Bomu, the most recent according to most of those interviewed was the 2008 – 2009 spills. However, the highest spills they ever had in Bomu occurred on July 11, 1970. It was known as SPDC Bomu-11 oil well blew out, which spilled oil over 607 hectares of farmlands. Ogoni has suffered and continues to suffer the degrading effects of oil exploration and exploitation: lands, streams and creeks are totally and continually polluted and nothing has been done to alleviate the suffering of these people. Pollution as we all know exposes people to new risk of diseases.

The upper part of the mangrove trees is an essentially terrestrial environment with a varied but little-known fauna of birds, mammals and insects. The mangrove swamps are usually subjected to disturbances following oil spills, gas flaring and oil spillage are likely to be high mortality rate of invertebrates and death of seedlings in the Niger Delta of Nigeria [5]. Gas flaring is related oil spillage and UNDP, 2006 estimates that Nigeria flares 75% of the gas it produces which is more than any other country in the world. Table 1 below shows some of the Global gas flaring estimates in some of the major oil producing countries.

Apart from the above issues the toxicity to Humans causing respiratory illness, leading to kidney disease, neurological disease and potential death [6]. Oil exploration and exploitation activities such as this have significantly contributed to the environmental degradation of the Niger Delta region in spite of government measures to stop gas flaring by 2008 and the existence of monitoring agencies, regulations and standards, the flaring activities in the area is still a problem. Gas flaring in the area is a major source of Cox, Nox, Sox and particulate matter and the cumulative environmental impact of these flaring activities result in contaminant build up on land, shallow ground water, greenhouse effect and general global warming and have also caused high concentration of acid rain within the region. There is no air quality because of pollutants in and around Bomu.

2.2. Environmental Impacts of Gas Flaring on Agriculture and Mangrove Swamps

Gas flaring is usually done to reduce the gas is released into the atmosphere but not without its side effect on the people living around the place. The study shows that apart from causing pollution, gas flares also retards the growth of plants. Cassava tubers have been observed to decrease in length and in weight with increasing proximity to flare sites [7]. This is quite true in Bomu, Ogoniland where we noticed that cassava growth was stunted and did not produce much if at all. Some fruits trees bearing trees around the flare sites grew well but did flower and therefore did not produce fruits. This is true for Bomu where at around Teban Gas Well Head, the mangoes some youth plugged for me had no sweet taste but rather tasted salty. The Teban gas and oil Well Heads are located at people's farmland.

It is at Teban location that there are both oil and gas heads. According to some of those that took us to the locations, it was the community that destroyed the gas head at Teban because it was causing the problem a lot of problems. Even after the destruction by the community, the gas head still vibrates. Gas flares have caused mirage of health issues to the community. Acid rain is another problem these people are suffering from and this gas flaring which has led to loss in biodiversity, with forest and economic crops being destroyed also corrodes their houses' corrugated iron sheets making them to rust with seven months or thereabout. The concentration of acid in rain water appears to be higher in the Niger Delta region and decreases further away from the region [8]. The heat generated from gas flaring kills vegetation around flaring area, destroys mangrove swamps and salt marshes, suppresses the growth and flowering of some plants, induces soil degradation and diminishes agricultural productivity [9][10].

Also, the people of Bomu complain of the health implications from gas flares. They complain of skin rashes, chronic coughs, eye irritations, cancer as well as other respiratory sicknesses. The impact of gas flaring on agriculture showed a direct relationship between gas flaring and productivity decline in agriculture. The table 1 below shows the impact of Gas flaring on agricultural.

Distance of Farmland from Flare site	Percentage Loss in Yield of Crops
200 meters	100 percent
600 meters	45 percent
1 kilometer	10 percent

Table 1: The Impact of Gas Flaring on Agricultural Output

Source: Salau, 1993:19-22, Adeyemo, 2002:69 [11] [12]

Gas flaring is related oil spillage and UNDP, 2006 estimates that Nigeria flares 75% of the gas it produces which is more than any other country in the world. Table 2 below shows some of the Global gas flaring estimates in some of the major oil producing countries.

Country	Percentage
United States of America (USA)	0.6
Holland	0.0
Britain	4.3
Former Union of Soviet Socialist Republic (USSR)	1.5
Mexico	5.0
OPEC Countries	Percentage
Nigeria	76.0
Libya	21.0
Saudi Arabia	20.0
Algeria	19.0
OPEC Total	18.0
World Total	4.8

Table 2: Flaring of National Gas in Major Producing Countries (% of Gross Production in 1991)
Source: World Bank Report, 1995, Vol.1:59

Apart from physical destruction of plants around the flaring areas, thick soot is deposited on building roofs of community and always make their roofing sheets to corrode quite often. This is because the dark-coloured water (with soot) from the roofs contain chemical and some of the people drink this rain water because there is no pipe borne water.

3. Results and Discussion

It is a statement of fact that Kegbara and Kpor communities and indeed Gokana Local Government Area (LGA) play host to about 52 of Shell Petroleum Development Company (SPDC) oil wells, one Manifold, a flow station, numerous pipelines and other oil exploration and exploitation activities since the discovery of oil in commercial quantities in Ogoni land. Arising from this, there has been numerous problems such as Gas flare, oil well-head blow-out, oil pipe leakage, crude oil spillages, manifold fire explosions and emissions and emission of offensive gases with adverse environmental consequences in the area. These agrarian communities, Kegbara & Dere, with a population of over 30,000 hosts over 80% of all SPDC's facilities in Bomu oil field, one of the largest manifolds in Africa and over 40 oil wells inclusive. The Bomu Manifold is located less than 150m to people's homes, accommodates high pressure trunk pipes that receive crude oil and gas from several SPDC's operational field in Eastern Niger Delta for transport to export terminal at Bonny ^[13].

Today Bomu is suffering environmental degradation and economic decline because of oil spills which have covered almost all parts of Bomu creeks. Oil was first struck in commercial quantity in 1956 at Oloibiri town in the present day Bayelsa State, the second discovery of oil in commercial quantity was at Bomu in 1958 – the Bomu oil field contributed major supply to the first shipment of oil from Nigeria in 1958. There are 96 oil wells connected to 5 flow stations in Ogoni operated by the SPDC of Nigeria (a subsidiary of the Royal Dutch Shell).

The local people here in Bomu informed me during the field work that the oil spills that have occurred in the community were because of equipment failure (pipe rupture), that many oil pipelines in Ogoni land as well as the Niger Delta are aged and have outlived their self-span. These pipes need to be changed or replaced. Information gathered from the interviewees has it that there are three (3) Oil Well heads located at Koro, Boo-or and Teban.

Boo-or Oil location is in people's farmlands, and as I said earlier, there is no oil head here anymore; it is pertinent to say here that farmlands and crops have really suffered in this area. A look at the water bodies shows that the entire aquatic system is polluted and will be difficult for aquatic lives to survive in such condition.

Mangroves and other resources deliverable from the seascape are to the people what taxes are to the governments. Mangroves provide the people with several goods and ecosystem services. The high caloric fuel woods from mangroves support the domestic energy needs of the people. Naturally, mangroves are productive ecosystems and host extra-ordinary biodiversity; most commercial fish stocks live their larval stages in the mangrove. Given the overwhelming dependency of Gokana people's livelihood on mangrove and artisanal fisheries, it is safe to infer that the spillage will largely undermine food security in the locality (CEHRD). Apart from the oil spills of the 1970 in Bomu, the most recent according to most of those interviewed was the 2008 – 2009 spills. However, the highest spills they ever had in Bomu occurred on July 11, 1970. It was known as SPDC Bomu-11 oil well blew out, which spilled oil over 607 hectares of farmlands. Ogoni has suffered and continues to suffer the degrading effects of oil exploration and exploitation: lands, streams and creeks are totally and continually polluted and nothing has been done to alleviate the suffering of these people. Pollution as we all know exposes people to new risk of diseases.

4. Conclusion

Although, the activities that come with the oil exploration and exploitation causes alterations to the environment. Which significantly have negative effects; some of the effects that come with petroleum development can be reduced or prevented basically by taking some steps in terms of prevention. Environmentalist and people generally give blame to the oil companies but the Federal Government provides the laws, legislations and license, which the oil companies must adhere too. The environmental damage caused by such poor clean-up methods could be disastrous, Emmanuel, an environmental scientist in Port Harcourt, said. "Oil does not burn at 800 degrees Celsius," he explained, "so when you burn

it, you just flare off the volatiles and gas. The dense crude remains... One drop of rain and you see the black spots," he said. Across K-Dere and similar villages in the region, like Bomu evidence of the damage is readily apparent in the oil sheen on the soil and water. The people of Bomu according to those interviewed are dying in silent over the activities of the SPDC.

The natural environment has been severally breached by the deleterious consequences of oil exploration. Flora and fauna have been adversely affected; cash and subsistent crops have had more than a fair share of defoliation because of incessant oil spillage and the attendant toxicity of the soil. Because of the foregoing, the food chain has been partially truncated by hybrid crops that are a caricature of their former selves. Thus, yam tubers have become unusually small and even sweet varieties of yam have become everything but sweet. Aquatic life has not fared much better. Some species of fish have migrated and others have become virtually extinct because of oil spillage and industrial effluents that are wantonly disposed in mangrove swamps and fresh waters in Bomu as well as across the Niger-Delta.

Finally, BP's Gulf of Mexico disaster has heightened international concerns about the environmental dangers of offshore drilling around the world and led to President Obama declaring it America's "environmental 9/11". This oil spill has been correctly identified as a massive emergency and it is time to recognise that the ongoing oil spills, conflict and human rights abuses in the Niger Delta should also be acknowledged as an emergency demanding a concerted international response. The lack of parity in the levels of response afforded to the US Gulf of Mexico oil spill, when compared to that given to the ongoing devastating spills in the Delta, have prompted us to highlight this situation and call for urgent action by the US, British and Nigerian governments and oil companies including ExxonMobil, SPDC and Chevron. Until the issue of Ogoniland degradation is addressed using international standard, the Ogoni people and her environment will still be in environmental bondage.

5. Recommendations

- Updating and revising the legislations, reviewing the license of the oil companies and reviewing the fines will go a long way in ensuring compliance, even though the government cannot systematically or frequently monitor these sites.
- Environmental restoration by government and oil companies should be done now and not tomorrow because tomorrow might be too late for the people. SPDC should as a matter of urgency clean and restore the mangrove forests and creeks and other water bodies of Bomu as well as Ogoniland.
- Adoption of environmentally friendly technology that will minimize impacts of petroleum development on the environment; gas flaring, the gas can be converted to alcohol for diverse uses or used as an alternative energy source.
- The hospital in and around Bomu metropolis need to be developed to a standard where all the illness suffered by the people resulting from oil spills and gas flares can be confidently treated. For this to happen, medical personnel and drugs need to be readily available.
- Considering the proximity to human settlement and the risk it poses to human Health, there is absolute need for the relocating of the manifold in Koro to a more distant location.
- Emergency units and Secondary Health care facility should be established in Bomu Health centre by SPDC to enhance rapid response to environmental disasters with a view to reducing hazardous impacts on host communities just as recently done in the case of oil spillage in Texas, USA.
- Periodic Environmental Impact Statement (EIS) and Environmental Impact Assessment (EIA) should be carried out in Bomu to know whether oil-related hazards are affecting the host community.
- Old manifolds and pipelines should as a matter of urgency be replaced and floating scum removed from the water bodies.
- Government and the oil and gas multi-nationals need to provide alternative means of livelihood to the people of Bomu who are mostly fishermen and farmers.
- There is urgent need to do thorough post spill assessment of the environmental and social impacts of the spillage, and carry out comprehensive remediation in the affected area in Bomu community of Ogoniland
- Oil companies should as a matter of corporate policy evolve effective contingency measures to counter oil spill incident(s) in Bomu, the Niger Delta as it is done in other Deltas of the world.

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