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Assessing the Perception of People of Environmental Resource Curse of Oil and Gas Exploration in Bauchi and Gombe State Nigeria

Iliya Garba[a]*, Adamu Jibir[b]

[a]**Department of Accounting, Faculty of Arts and Social Sciences, Gombe State University, PMB 127, Gombe, Nigeria*
[b]*Department of Economics, Faculty of Arts and Social Sciences, Gombe State University, PMB 127, Gombe, Nigeria*

A B S T R A C T

Oil and Gas exploration was commissioned in Bauchi and Gombe state Nigeria in the year 2019 and the two states were about to be listed among oil and gas producing states in North-East Nigeria, after the discovery of oil in the Niger Delta region 60 years ago. However, the communities' optimism has widened on the perception that the oil and gas sectors were the turning point fortune for socio, economic, development, and improvement in the living standard of people. However, a major adverse implication of oil and gas explorations is the environmental pollution impact on the communities which affects the environment and health wellbeing of people adversely. Conflict may also resurface, for example, land ownership and urbanization among the peaceful living communities. The study explored communities' perceptions regarding the environmental consequences of the oil and gas sectors. Data was collected for the study through a questionnaire. The findings revealed that the majority of the respondents were pessimistic about the prospects of oil and gas sectors ensuring national development and income distribution. It has been concluded that the communities received inadequate information about the environmental impacts of oil and gas exploration; hence, they eventually considered it as a resource curse. It has been therefore recommended that strict compliance to environmental policy actions such as the imposition of market-based instrument environmental taxation, in particular, to protect the environment against the potential Cul-de-sac.

Keywords: Bauchi, environment, oil and gas, Gombe, pollution

*Corresponding author: Igarba204@gmail.com

1. Introduction

The environmental externalities associated with oil extraction and explorations which include water pollution, air pollution, and greenhouse gas emissions exemplify a classic tragedy of the common, (Adam et al., 2019). Due to the enormous financial resources that can be accrued from this industry, the discovery of oil and gas in any location, particularly in developing countries, is greeted with great optimism and becomes cheering news; such as the case in Kolmani River I, which was drilled in 1993 and was later terminated after 8000 feet only, and recorded about 33 million standard cubic feet of gas resources, but was rendered noncommercial quantity by (IOCs) Shell; Chevron and Total, after seismic data report (NNPC, 2019). This led to the suspension of the operation and relinquished the blocks in line with their contractual obligation in 2000 (Mohammad, 2018; NNPC, 2019).

The Federal Government does not relent in its effort to search for oil in the inland waterways and now, Kolmani River II well which was located at Barambu exploration site with oil prospecting licenses (OPL) 809 in Alkaleri Local Government Area of Bauchi State, (NNPC, 2019 ; Punch Nigeria, 2019). This has emerged as cheering news. Oil and gas fields recently discovered in Bauchi and Gombe state area, hitherto agitation by the surrounding communities for listing among the oil-producing states and enjoying the petrodollar like the Niger Delta Region. These states will start to get 13 percent derivation revenue besides the oil companies, as their corporate social responsibilities will probably intervene to alleviate the living conditions of the communities. The oil and gas were discovered in commercial quantities (Baru, 2019). This has led the Federal Government of Nigeria to initiate a seismic survey and spudding in to ascertain the quantities of hydrocarbon in the oil fields.

Furthermore, the host communities were very optimistic about the new development, hoping for the creation of jobs and improvement of the economy through investment in infrastructure development, education, and health, without seeing the environmental perceived challenges of the presence of oil and gas extraction and petroleum-producing industries, as happening in Niger Delta Region, which has led to the "resource curse", as noted by Ameichi, (2010). The risk of the "resource curse "associated with extractive industries is very critical; hence, the redistribution of oil and gas resources should not be taken for granted (Brobbery, 2014). It has been asserted by Mustapha (2019) that environmental pollution and gas flaring have become the major challenges that have continued to affect the means of their livelihood, such as farming and cattle rearing, and healthy living, which is awaiting the newly host oil-producing communities.

The paper aimed to examine the social factors such as health, environmental impacts of oil and gas extraction, migration, and urbanisation which have affected the communities in the places where it has been found.

1.1. Statement of the problem

Extractive industries such as oil and gas are known to have pervasive adverse social and environmental impacts on the communities in which they operate, especially in developing countries where there is a very weak regulatory policy on environmental protection.

Although the issue of environmental pollution is crucial in Nigeria it has often been relegated to the periphery in the empirical literature. There is no solid support of environmental awareness and protection, which will help in climbing up the political agenda. The greening politics, the idea of using market-based instruments to control pollution and

environmental degradation has to be taken up in the political discussion from ward to the federal level (Rapanos, 2004).

Similarly, another area that has also suffered a little neglect in the extant literature and studies was the application of market-based instruments, such as environmental taxation (considered the best for pollution abatement), which is of particular importance since the pollution control measures may affect growth and employment, which are burning issues in Nigeria, because of its low per capita income. Furthermore, the theoretical literature in this area is also limited. Based on this observation, this research study was necessitated to fill these gaps; and therefore, will contribute to the existing literature and academic knowledge in the focus area.

1.2. Research objectives
The main research objective for the study is to assess the impact of oil and gas exploration on the inland waterways. The specific objectives are:

RO1: To examine the positive and negative expectations of the communities of the discovery of oil and gas in their communities.
RO2: To assess the level of regulations to be imposed on this oil and gas industry.

1.3. Research question
On the basis of the aforementioned research objectives, the following research questions were derived.

RQ1: What are the positive and negative expectations of the communities of the discovery of oil and gas in their area?
RQ2: What are the global regulatory approaches to be adapted to regulate the activities of these industries?

2.Theoretical underpinning: theory of "oil-rich or wealth nation"
This theory was propounded by Amoako and Owusu, (2012). He asserted that countries with well-endowed oil and gas resources become developed at a faster pace but with a high level of crime. The theory explains that the oil and gas extractive industries usually have greater opportunities to expand their economies through socio-economic infrastructural development such as job creation, provision of social amenities, and better living standards. However, this often comes at a cost. When the resources are not properly managed this could mean that any attempt by the state to misappropriate the revenue generated from the oil and gas extractive industries could lead to unfortunate circumstances, such as disorder in the form of political instability, environmental pollution, and resource curses. Indeed, this theory is relevant for this study in two ways: first, it places Bauchi and Gombe state in the context of oil-rich state in Nigeria as one of the six oil-producing countries in the world, which the research work found to be correct; secondly, it advances the argument made earlier that oil wealth economies are often manipulated and controlled by the capitalist economy. For example under the capitalist economic system, their aim is to maximize profit only. Oil and gas, or any natural resources are explored by the multinational corporation from exploration to exploitation, and from transformation to the marketing of the products. The fact is that the exploration and exploitation of natural resources require huge capital investment, and this is usually undertaken by those multinational companies (Collins, 2015). To this end, for a developing country like Nigeria owing a national resource does not automatically transform

the citizens and the country into fabulous reach as the resource wealthy or oil-rich nations, the theory projects. Besides the role played by the multinational corporations, multinationals whose activities were largely responsible for the degradation of the area had cashed in on the weakness of those institutions to shortchange the region and also to undermine environmental laws in Nigeria. Since those companies are themselves not transparent in disclosing the damage done to the environment in their annual financial statements as noted by Pulver (2007), the invariable conflict will always be the resultant effect. It is very rare to find any oil-rich nation in Sub-Saharan Africa operating a transparent and accountable oil and gas economy due to pervasive patronage politics and crony capitalism (network involving cronies' advantage position for mutual reciprocal benefit).

This study finds this theory to be inconsistent with the reality of the oil and gas extraction economy, in terms of failure to disclose the actual damage costs of pollution as a result of their operations. Therefore, it argued that the theory could have shown how oil-rich nations could also serve to benefit other economies and not be seen as only facilitating doom. Oil and gas revenue could promote national development if media has access to information about the sector which is not facile, and stakeholders do not lack insight into the operations, and government and oil and gas partners desist from patronage politics and excessive capitalism.

The researcher conducted an exhaustive review of the scientific literature and solicited expert advice to identify the potential health and environmental risk associated with oil extraction and production which led to an adverse environmental impact on soil, forest, and water of the Niger Delta communities in Nigeria (Kadafa, 2012). It has also been noticed by Aigbedion, Iyayi, and Agbeboh (2007), that the oil explorations have ultimately affected peasant agriculture in a variety of ways, which ultimately have caused problems of, environmental refugees. Some of the landless farmers migrate to other more fertile lands in other rural communities in Bayelsa state, putting pressure on scarce fertile lands. While some of the displaced farmers out-migrate to the urban areas in search of other means of livelihood, like trading.

Forced resettlement was also identified as associated with the development of extractive industries, it has been reported that in the Niger Delta Region of Nigeria thousand were forcefully evicted to make way for crude oil extraction in Nambe Local Government Area of Rivers state; as such, the people of the community lost venerated ancestral homes, died from contamination of oil spillage and their livelihoods were jeopardized (Ikelegbe, 2017). UNEP (2011) report indicates that local communities in the Niger Delta region were affected by diseases, such as respiratory diseases, skin rashes, coughing, gastrointestinal problems, different kind of cancers, and malnourishment were very common amongst the children. However, Kadafa, 2012 asserts that when petroleum hydrocarbon is released into the environment, processes alter the chemical composition. Physical weathering will be noticed and therefore, affect the living organism. The effects can be either direct damage to resources or the ability of the environment to support a resource. In the Niger Delta region, there is a lack of compliance with technical legislations on permissible levels of many pollutants on the practices for the management of production waters, drilling mud, and gas flaring. The activities of oil companies operating in the area have led to contamination of air, water, and soil in residential areas close to oil fields (Kponee et al., 2015).

3. Empirical review

It has been well documented that western countries seem to be derived more blessing from the oil discovery and exploration at the expense of Africans, particularly Nigeria. A good case in point is Norway, which was understood to be the poorest country in Scandinavia at the end of the 1960s, before the discovery of oil, but as of today ranks among the wealthiest. Akosua, (2019), attributed this success to Norway's ability to prevent rent-seeking behaviour and corruption in their oil and gas sector, which have been identified as core elements of the resources curse in the African countries. A study from the Niger Delta Region of Nigeria, reports a higher frequency of neurological, haematological, and severe irritation symptoms in inhabitants from a community. The main sources of their drinking water are contaminated with refined oil products, compared to a neighbouring community (Kponee et al., 2015).

Studies from the Peruvian Amazon in Latin America compared blood lead levels among indigenous children and adults according to distance from the place of residence to the oil field. The blood lead levels were high in the area, (Orta & Napolitano, 2015 as cited in Cristina & Marti, 2016)

Furthermore, groundwater in Rivers State has been heavily contaminated as a result of oil extraction, which caused a lot of public health issues putting the community members at extreme risk (UNEP, 2011) and thus, it lets to the observation of the surrounding creeks which is widespread and severely impacting many components of the environment. Extraction-related contamination leads to exposure to a mixture of contaminants. Produced waters originate in the natural oil reservoir and are separated from oil and gas in the production facility; and produced water represents the major petroleum-derived waste (Kponee, Chiger, & Kakulu, 2015). They contain toxic compounds of natural origin, such as polycyclic aromatic hydrocarbon (PAHs) BTEX (benzene, toluence, ethybenzene, and xylenes), heavy metals, and occasionally naturally occurring radioactive materials; and may also contain chemicals from drilling fluids and treatment chemicals. (Abdullah,& Biak, 2009)

A world development report of the United Nations Conference on Trade and Development (UNCTAD, 2007 as cited in Akosua, 2019), stated that extractive activities (including oil explorations) can also have profound social and political impacts. They can have positive effects on development by creating jobs, encouraging businesses, and providing vital infrastructure for remote communities, such as roads, electricity, education, and health; as well as negative effects such as gas flaring, high risk of diseases, conflict among the communities, and degradation of the eco system.

However, the presence of these hydrocarbon reserves has been identified by many scholars as a potential mixed blessing for oil-producing countries and communities (World Bank, 2006). Although the discovery of oil creates a sense of hope and expectations amongst the communities that the revenue would lead to the development of local communities and region as a whole, in most cases these dreams have remained illusory as the extraction of all resources has led to the destruction of local communities and anarchy in the area; thereby, causing serious conflict.

4. Methodology
4.1. General features of the study area
The study area comprises the village surrounding Kolmani River II well which was located at Barambu, Kwaimawa, and Dogonruwa. These villages are less than 5 km away from the oil

well which is located in Alkaleri and Akko Local Government Area of Bauchi and Gombe state in North-Eastern Nigeria. The villages are located on latitude 10°. $8847^'$ and longitude $11^o5148^'$. The climate of the area is humid tropical characterized by wet (April – November) and dry seasons (December to March). The vegetation around the areas is mostly millet, corn, maize, and to some extent cassava, which were produced by the community year in year out long before the discovery of oil.

The communities in the studied area were predominantly peasant farmers and were mostly male, 78.5 percent of the population. Five villages were chosen from the area, where 123 respondents were chosen as the sample size, consisting of approximately 83 Males and 40 Females who responded to the questionnaire. Most of them were married (above 89 % in both areas), and the household size was quite large in both cases ranging from 3- 8 persons. The literacy level of the people in the vicinity of the oil well area is about 42.7 %, and this may also create a lower awareness of the danger of oil pollution and gas flaring in the targeted area. So the tendency to value lowers the damaging impact. The majority of the respondents in the area are indigenes and on ethnocentric grounds indigenes in oil and the gas discovery area are more likely to avert damage and seek greater intervention by the government to reduce the pollution.

4.2. Survey instrument

The instrument used for this study was a questionnaire consisting of 13 items that measure public perception. The items of the questionnaire were adapted from the previous studies and further modified for use in this study. A total of five experts were involved in the validation process of the questionnaire. The questionnaire were used on 5 Likert scale rating: 1 = very untrue, 2 = not true, 3 = quite true, 4 = true, and 5 = very true. The questionnaire also went through a reliability test. A pilot study was conducted with 90 respondents of similar environmental challenges. The results of the pilot study showed that the questionnaires were highly reliable because the Cronbach Alpha value of the stud's construct (refer to Table 1) was greater than .90. Hair, Black and Anderson (2010) claim that if the Cronbach Alpha coefficient of a question exceeds .70, this indicates that the questionnaires have good reliability. Therefore, the questionnaire was ready to be used in the field of study without having to go through any amendments.

Table 1: Cronbach's Alpha Coefficient for Study Constructs

Construct	Variable	No of items	Cronbach's α
Positive and Negative Expectations	Access to Health, Education	5	.920
	Access to Electricity, Drinking water	6	
	Access to Good road	5	
Negative Expectation	Environmental degradation, reduction in agricultural yield, conflict of interest, force resettlement	8	.953
	Land crisis, environmental pollution, loss of livelihood, animal grazing interference	9	

4.3. Descriptive statistics of respondents

The descriptive statistics of constructs of the questionnaire administered are indicted in the table below showing the mean, standard deviation, kurtosis, and skewness scores of the construct. The average score from the 5 point Likert scale is computed to show the proportion of the respondents that have responded with either very untrue or very true for the various items. The mean score of each item in the questionnaire is obtained through the use of SPSS Computer variable version 23.

Table 2: Responses on the Positive Expectations of Oil Extraction

Items	Mean	Standard Deviation	Skewness	Kurtosis
Access to health	3.9930	.75523	.012	-1.235
Access to education	4.0070	.74585	-011	-1.189
Access to electricity	3.9441	.69986	.077	-936
Access to safe drinking water	4.0699	.67813	-086	-802
Access to good road	4.1119	.71311	-166	-1.010

Source: Researcher compilation 2020

Table 2 depicts the responses of respondents from access to health to access to good road in the questionnaire as the positive expectation for the improvement of social service delivery in the study area. Access to health presents a mean score of 3.9930 on the 5 point Likert rating and a standard deviation result of 0.75523. The mean indicates that the distribution is positively skewed indicating high scores. The kurtosis of the sample indicates that the distribution is flatter than normal indicating that the distribution is platykurtic. Thus, results on the average show that 72 % (123) of the respondents in the study area support the notion that oil exploration will improve access to health well-being for the communities, similar to the perception of respondents of the Niger Delta Region in the empirical literature.

Responses on the second item Access to Education revealed a mean of 4.0070 and a standard deviation result of .7485. The mean indicates that the distribution is negatively skewed which indicates low scores, moreover the kurtosis of the variables also indicates that the distribution is flatter than the normal indicating that the distribution is platykurtic. Thus, results on the average show that 72 % (103) of the respondents in the study area support the notion that oil exploration will improve access to good education for the communities.

Further, a critical review of the responses on variable three showed clearly that as a whole, respondents representing a percentage proportion of 78 %, affirmed that access to electricity will help in positively improving the expectation of the people in the attainment of social life status of the communities, as seen by a mean of 3.9441 and a standard deviation of .69986 which indicate the positive skewness of the distribution; although, kurtosis indicates the distribution is platykurtic due to its distance from the mean.

Also, the responses on access to safe drinking water revealed outright that about 78% of the responses support the fact that access to safe drinking water is a welcome development, which is also reflected in the mean value of 4.0669 and standard deviation of .67813. The mean as shown indicates a negative skewness with the value of -086, and also the kurtosis is flatter than the normal distribution indicating platykurtic.

Finally, the descriptive statistics as captured in the table, the mean standard deviation, skewness, and kurtosis are all displayed in this part on a 5 point Likert scale; however, the mean value for the items related to positive expectation is very high: 4. 119. Compared to the various mean values this shows the respondents' interest in access to a good road.

Table 3: Responses on the Negative Expectations of Oil Extraction

Items	Mean	Standard Deviation	Skewness	Kurtosis
Environment will severely degraded	4.0769	.77892	-226	-1.058
It will lead to a reduction in agricultural yield	4.1748	.75353	-401	-811
Conflict of interest	7.0350	.11.73379	3.887	13.350
Force resettlement	4.1818	.62389	-853	3.820
Environmental pollution will worsen	4.3217	.57655	-161	-624
Loss of livelihood	4.2448	.54665	0.76	-306
Livestock Grazing	4.3077	.57201	-117	-588

Source: Researcher compilation 2020

Table 3 above presents the mean, standard deviation, Kurtosis, and Skewness of the respondents on their various opinions on the severity of the damage of oil exploration on the area for livestock grazing in the questionnaire administered. Responses are targeted to address the research questions of the study which have to do with the negative expectation of oil discovery. Responses on negative expectation revealed a mean of 4.0769 and a standard deviation result of .77892. The mean indicates that the distribution is negatively skewed which indicates low scores; furthermore, the kurtosis of the variables also indicates that the distribution is flatter than normal indicating that the distribution is platykurtic. Only the variable conflict of interest has a positive skewness of 3.887 which indicates high scores; the kurtosis of the variable also indicates that the distribution is leptokurtic in nature, indicting peaked distribution.

4.3.1. Oil discovery and the host community expectation

Due to human nature, when substantial resources are discovered in the surroundings particularly oil and gas, people tend to form high expectations with the belief that their livelihood will change for the better (Kliza, Bategeka, Sewanyana, 2011). The positive expectation is anchored around expected improvements in social services delivery, infrastructural development, employment opportunities, and so on.

4.4. Positive expectations

The results from the household survey indicated that with regard to improvement in the social service delivery including improved access to healthcare (78%), education (83%), electricity (84%), safe drinking water (70%), and infrastructure such as roads (87%) as indicated in Table 2.

These expectations partly reflect the needs of the local communities, especially where the oil extractions are taking place. It is fair to say that, some of the expectations are influenced by the ongoing efforts by the government with regards to infrastructure development projects, such as road constructions, hospitals, and also upgrading some schools to petroleum exploration institutions at Alkaleri LGA that will be critical to the youthful

population to gain the required skills that are needed in the oil industry in the area. It should be, however, emphasized that before the oil discovery, access to such services was very difficult in the entire region. Infrastructure facilities will help boost their economy. People can now take their agricultural produce to a distant market at a low cost and higher price. The survey results indicate that 90% of the communities that responded to the questionnaires expect to benefit from the improved business opportunities.

Furthermore, there are high expectations of job opportunities in the current state of development in the oil and gas sector. The result indicated that there were no households with at least one member who has a skillful qualification that will enable him to find higher ranked direct employment in the international oil company. Instead, the majority of the jobs available are for unskilled labour, such as security personnel and drivers, etc; and this may necessitate a low level of employment in the particular industry.

Another positive expectation is that the communities expect to gain access to clean water and a stable energy supply because most of the households in Barambu and Kwaimawa area depend on the environment and harvest firewood in order to meet their energy demands. Due to the low level of modern energy use, and low electricity access rates in the area, the majority of the households hope that the government with support from developing partners will implement a rural electrification project in the area.

Table: 4: Positive Expectations from the oil and gas industry in Percentage

Items	Yes	No
Access to health	78	22
Access to education	83	17
Access to electricity	84	16
Access to safe drinking water	70	30
Access to good road	87	13

4.5. Negative Expectations

The communities express concern with regard to the likely arrival of some migrants (72%) in search of new economic opportunities from within and outside the region, land crisis (68%), environmental pollution (71%), interference with livestock grazing (54%) and loss of livelihood (46%).

The communities fear that the development of the oil and gas sector is likely to result in two separate challenges: the issue of land conflicts and the issue of rapid urbanisation (Joseph, 2019). The threat of urbanisation is expected to exert pressure on the delivery of social services such as water, education, health, etc, but could also trigger other secondary socio-cultural challenges which were not known before, such as prostitution, theft, alcoholism, promiscuity, and insecurity (Tantua et al., 2018; Obi, 2010). All these challenges pose threats to the local environment development. For example, prostitution, alcoholism, and promiscuity are risk factors for the spread of sexually transmitted diseases, crime, and general breakdown of morality (Joseph, 2019). Increasing land crisis and conflict over control of land among the two states is considered one of the most serious social impacts that are bound to come up.

The land-related conflict was not common in the area before, but with this development, the conflict on ownership of land and border is perverse among the two states and the communities. The two states are now in a war of words about the actual location of the oil well (Daily trust Nigeria, 2019). Therefore, the conflict also emerged when some absentee landlords sought repossession of their land with the intention of benefitting from speculation compensation from the oil companies for damage done to their land as a result of oil mining activities.

Table 5: Negative Expectations from the Oil and Gas Industry as a Percentage

Items	Yes	No
The environment will be severely degraded	75	25
It will lead to a reduction in agricultural yield	70	30
Conflict of interest may be the order of the day	55	45
Oil extraction will lead to force resettlement	72	28
The land crisis will increase	68	32
Environmental pollution will worsen	71	29
Loss of livelihood	54	46
Interference with livestock grazing	46	54

5. Findings

The fact that oil has been discovered in an ecologically fragile region in the northeast part of the country presents a risk to environmental management and biodiversity conservation. The risk of environmental degradation, water and soil contamination, and their related adverse health risks have to be examined with a broader sense of human development to ensure that the oil industry creates an enabling environment for the communities.

5.1. Conclusion and recommendations

The discovery of oil and gas has presented a significant opportunity for the social and economic transformation of the state. However, exploitation of natural resources is also associated with negative impacts as it leads to resources curse effects. Despite the negatives expectations expressed by the communities of the affected area, this research work is of the view that oil and gas resources have the potential to improve both the economic and social well-being of the communities. Therefore, the study recommends, amongst others, to open up a discussion on environmental justice as most of these damages are caused by external factors in the industries, as a result of the nature of their productions of goods and services which are hazardous to the environment, and causes the host communities to suffer. Therefore, the imposition of market instruments approached environmental taxation, in particular, to tax the polluting industries to reduce the impact of pollution in the communities.

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